CALIFORNIA STATE LIBRARY

THE VETERINARY JOURNAL

AND

Annals of Comparative Pathology.

JANUARY, 1892.

SEPTICÆMIA IN A DEER.

BY J. A. NUNN, F.R.C.V.S., D.S.O., ETC., PRINCIPAL, LAHORE VETERINARY SCHOOL.

THE case in question occurred in a young, tame, female deer that had been bitten by a dog. The owner being ill, it was left to the care of native servants, and was not properly attended to until 10 days after the injury had been inflicted. When admitted to hospital on the 13th November, there was a large wound on the near quarter, extending almost the whole length of the femur down to the patella. The edges of the wound were deeply under-run, and the whole was fly-blown, the triceps, external vastus and ischio-tibialis muscles being in a gangrenous condition and sloughing. There was also a deep ulcerated wound at the back of the limb, about an inch above the point of the hock, and the gastrocnemius tendon was badly torn, a large portion afterwards sloughing away. The wound was cleaned, the gangrenous portion of the skin and muscles removed, the whole irrigated with corrosive sublimate solution, 1 in 1000, and afterwards dressed with iodoform. On the 16th there was considerable erysipelas of the whole of the tibial region. This was treated with belladonna externally, and tinc. ferr. perchlorid., 4 minims, and pot. chlor., 4 grs., in a draught morning and evening. On the 18th, all symptoms of erysipelas had vanished, and the treatment was discontinued. The case did well till the 20th, when the temperature rose to 103·8, with a muco-purulent discharge from both nostrils. The animal was found dead at 6 a.m. on the 21st.

Post-mortem at 11 a.m., 21st November, 1891. The body

was well nourished. At the umbilicus a hard tumour was felt. On dissection of the wound, the whole of the adjacent muscles were infiltrated with minute abscesses. The sacro-sciatic nerve was highly inflamed, and there was a large clot in the popliteal vein. The inguinal lymphatic glands were highly inflamed, and showed numerous points of pus on section. The ilio-cœcal valve was highly congested. The rumen showed four deep ulcers, with the characteristic raised edges. The lungs showed old adhesions on both sides, but more particularly on the right. Both lungs were in a gangrenous condition, and were simply a mass of minute abscesses, especially the right one. The heart was adherent to the pericardium, and both it and the endocardium had well marked ecchymosis on them. The right side of the heart was almost filled up with a large ante-mortem clot, that passed right through the auricular-ventricular opening. The tumour felt at the umbilicus turned out to be 6 hair calculi in the rumen, that altogether weighed $3\frac{3}{4}$ ozs. There was an entire absence of the new mown hay smell that is so characteristic of septicæmia in the human being.

This case appears to show how little chance there is of deer living that have been wounded and escape into the jungle, and how, from motives of humanity, sportsmen should refrain from firing "Long" and "Snap-shots."

VETERINARY DENTAL SURGERY.*

BY J. F. FISHER, V.S., BRANDON, MANITOBA, CANADA.

THE subject of my paper this evening, viz., Veterinary Dental Surgery, is one in which the profession of late years has taken deep interest. A knowledge of the derangements and diseases of the teeth is indispensable to the veterinarian, owing to the important relations which these organs bear to the system in general; and although there yet remains a great field for the student to cast light on the mysteries in which certain diseases of the teeth are still more or less involved, and for the ingenious inclined to perfect instruments to facilitate the work of the operator in performing the surgical portion of the treatment, yet during the past few years a great advancement has been made by veterinarians in that branch of our profession, known as Veterinary Dental Surgery.

* Read at the Meeting of the Veterinary Association of Manitoba, Canada, on July 22nd.

Position for Operating.—The standing position is to be preferred in operating in all practicable cases, for however cautious the surgeon may be, if the lying position is adopted, owing to the manner in which the head is placed while operating—the crest downward and muzzle upward—accidents may arise from diseased teeth and from tooth fragments dropping into the throat and being swallowed, which may result in the production of intestinal calculi and tympanitic affections; also in cleansing the sinuses of the head, the fluid is apt to pass into the larynx, and, finally, the lungs. The speculum should be used as little as possible, as it often produces excoriations of the gums and bars, and sometimes exfoliation of the denuded bone. The mouth should be kept open and all floats, molar cutters and extractors handled by means of the hand and arm in the following manner. If operating on the lower molars, pass three fingers alongside of tongue, pressing it over between molars of opposite side, the other finger and thumb to be used in giving pressure on float and guiding molar cutters and extractors, with arm in interdental space. When operating on upper molars, press thumb against first molar, fingers passing up alongside of cheek letting float run between thumb and fingers with arm in interdental space. When operating on upper incisors, place arm in interdental space, and pass thumb and first finger around incisor teeth, raising upper lip. Handle lower incisors in same way.

Horses from youth to old age should have their mouths occasionally examined to see that the teeth are in right condition; for unless the food is properly masticated, the animal does not receive that nutrition which it requires.

Diseases of Dentition.—The effects of dentition on the system generally, have perhaps received too little attention. Experience teaches us, however, that in cough, fever, diarrhœa, dysentery, diseases of the eye, loss of appetite and condition, catarrhal and bronchial inflammations, lymphatic and glandular tumours about the head, cutaneous eruptions and general derangement of the constitution, we will frequently find the producing cause to be some irritation from teething. The symptoms most likely to attract attention would be difficulty of mastication or deglutition, stench of the breath or buccal secretion, and discharge of saliva from the mouth, with occasional slobbering. Upon examining the mouth, the gums may be found to be hot, painful, and stretched from the pressure of the teeth against them, or the unshed crowns of temporary teeth may be found to be entangled with the new teeth, thus causing a source of irritation

interfering with the feeding of the animal. The cutting of the canine teeth is most likely to cause trouble, and should be well looked after. Horses at 4 years old are often subject to a distressing cough, due to the eruption of so many teeth at this age, which causes excessive dental irritation, often extending from the gums of the 6th molar to the fauces and larynx. Lampas also often occurs from the process of growth going on in the teeth, inflaming the gums-which is propagated to the bars, or from some febrile tendency in the constitution. Supernumerary or wolf teeth—the meaning of the term being hurtful or destructive—are sometimes to be met with. They produce irritation of the gums, injury to the eyes, affecting chiefly the mucous membranes and lachrymal glands, causing a weeping from same, through nervous connection, and when they encroach on the maxillary branch of the fifth pair of nerves, they produce symptoms of insanity. The treatment of dentitional diseases consists in careful dieting, with gentle alteratives, lancing the fevered gums, and extracting the obstructing temporary and supernumerary teeth.

Irregularities of the Teeth are caused by: (1.) Anomalies in the proper number; the development of abnormal teeth, situated within or without the rows or in front of the normal range of grinders, is an obstacle to the cheek when on the outside, the tongue when on the inside, and their growth not being counteracted by wear, they lacerate the mucous membrane, interfere with the action of the lower jaw, and the exact apposition and friction of the teeth.

(2.) *Irregularities of the Rows.*—The lower rows of grinders form nearly two straight lines, converging towards the symphysis of the chin, and the upper rows two curves; these, owing to congenital malformation or injuries, may be of such a nature as to interfere with the surfaces of friction, the result being abnormal development of the borders of the crowns on the inside of the lower and the outside of upper molars. This defect is also often produced by the lateral mo vement of lower jaw not being effected throughout the limits of the segment of the circle, such being necessary to cause friction, the upper grinders being wider than the lower. Vicious inclinations of the tables of the teeth are occasionally met with in the tables—forming planes so much inclined that they close together like a pair of shears; the teeth in such cases grow to an unnatural length, no friction being produced to cause wear, the half-masticated food in consequence slipping into the pouch of the cheek. Lack of regularity in the

length of the rows produces a peculiar deformity in the first upper and last lower molar. The projecting part growing until it reaches the opposite jaw, produces serious consequences if not immediately attended to. When a tooth is deficient or partly deficient, whether from fracture, caries, or arrestation of growth, it is gradually destroyed by the opposite tooth, which grows until it entirely fills the space, and then, if not interfered with, commences its work of destruction on the maxillary bone. Another deformity, not very uncommon, is where the lower teeth wear with greater rapidity than the upper, due to the latter being of greater size and strength; and when the wear extends to the sockets, mastication of hard food is next to impossible. For this defect there is no remedy, but the progress of destruction may be retarded by the use of soft food.

(3.) *Irregularity of Incisor Teeth.*—The development of abnormal teeth and obstructing temporary teeth is to be met with in the incisors, as well as the molars. The deformity called parrot-mouth, also often occurs, the evil effects of which are met with as soon as the lower incisors become so long as to bruise and otherwise injure the bars.

Symptoms of Irregularities of the Teeth.—Difficulty of mastication; the animal excited by hunger takes the food with avidity, but the motion of the lower jaw is often made only at one side, and with a sort of hesitation. The food, not being properly masticated, will not pass through the narrow pharynx, and the mouthful is again dropped into the manger; the coat soon becomes dry and staring, pulse weak, and the animal sweats on the least exertion, this being due to insufficient nutrition. But when the jaw-bones are contused, the gums inflamed, and the buccal membrane excoriated, the animal loses his appetite, becomes dull and agitated, with febrile disturbance; stringy saliva dribbles from the mouth, which is fœtid, when mixed with pus, the mouth is hot, and the membrane injected; there is swelling of the gum at the point of inflammation and tumefaction of the bone. The diagnosis is precisely determined when the mouth is examined, for then can be perceived the particular signs of each of the alterations that oppose the function of mastication. The examination of the mouth should be made as follows;—in examining left side, pass left hand alongside of tongue, pressing it over between molars of opposite side, then cleanse nicely with water. The sight may then be sufficient to detect swollen sockets, vicious inclinations or projections of the

tables, fractured, elongated or deficient teeth, an accumulation or greenish remains of food at affected part, and the existence of a blackish spot or cavity on one of the faces of the tooth, particularly the crown. If its nature cannot be discovered by the eye, it will be necessary to resort to the sense of touch, which is done by feeling with the first finger for the seat of trouble. In testing for carious teeth, keep mouth open with left hand as aforesaid, then take molar cavity cleaner in right hand, pass up alongside of left hand, and lightly tap each tooth, carefully noticing if any pain is evinced. Handle right side in same manner, using right hand in mouth.

Side and Hard Pullers.—This defect is due to the bit pressing the cheeks against some of the sharp projections of the molar teeth, thereby lacerating them, and is often to be met with in the deformity of the first upper molar projecting over the lower, the sharp overlapping point piercing the cheek or tongue, whenever pressure is brought to bear on the bit. It is also sometimes due to the space between the canine teeth being too narrow for the tongue, the bit in consequence not coming in sufficient contact with the sensitive bars, and the tongue being kept constantly in a state of irritation, by coming in contact with the canine teeth. The remedy for this is to cut off the canine teeth with bone forceps, remove all sharp molar projections with closed cutter, and round edges with float.

Caries of the Teeth.—Caries, dental gangrene or decay, is seldom met with in the incisor teeth; the grinders are those which almost invariably suffer. It may primarily attack the crown, neck, or root of the tooth, but wherever its primitive seat may be, the blackish seams always extend into the dentine, and thus isolate the plies of enamel. Caries usually attacks the dentine of the crown, between two folds of enamel. It is usually produced by some hard material pressed between the tables, causing fracture of the enamel, and such injury to the dentine that it dies, or has not the power to resist the chemical action of the fluids of the mouth. The decomposition of the dentine and the putrefaction of saliva in the cavity emits an offensive odour. The decay progresses between the folds of enamel, which, notwithstanding its great density, takes on the blackish tint of the dentine, and becomes sufficiently softened to admit of its being cut by a sharp instrument. Carious teeth rarely preserve their form or volume. When the disease penetrates to the root, it becomes hypertrophied, the alveolar dental membrane becomes irritated by the decayed

tissue, and deposits osseous matter around the root, until it presents a succession of osseous tubercles, which bar in the tooth and render its extraction difficult. The root, augmented in volume, can no longer be contained in the cavity, the walls of which expand, causing extreme pain in the adjacent parts; the osseous tissue tumefies, and suppuration is established in the interior of the socket; the membrane is partly destroyed, which leaves the bone bare and exposed to the pus and irritating matter which penetrates into the socket by the dental fistula. The bony tissue sphacelates on the borders where its substance is the most compact, and its spongy tissue—which forms the bottom of the cavity—soon becomes the seat of an interstitial suppuration, the swelling sometimes extending throughout the entire maxillary bone. Caries of the roots is rare, and chiefly arises from external injury or a constitutional predisposition. Caries of the neck is much more common than that of the root, and is caused by the food decomposing in the interspaces between the teeth, exciting inflammation in the periodental membrane. The position of the diseased tooth should always be taken into consideration. The two first upper molars are separated from the nasal cavities by a thin bone which is easily eaten through. When caries attacks their roots, the inflammation extends to the membrane lining these cavities, and the perforation of the osseous partition establishes a communication between the mouth and nose which permits the food to pass through the dental fistula into the nasal chambers. The 3rd molar is situated near the maxillary sinus, from which the root is separated by a thin diaphragm; when caries affects its roots, severe pain is often caused by nervous complications; the larger fasciæ of the superior maxillary branch of the 5th, which makes its exit upon the face by the submaxillary foramen, are placed immediately over its root. The 4th, 5th and 6th molars, are situated immediately below the maxillary sinuses. These communicate with the sinuses as easily as the first and second do with the nose; but the case is far worse for the horse, there being so little outlet for the pus.

Symptoms of Caries—

1st. Fœtor of the mouth and the secretions within it.

2nd. Dribbling of an abundant and stringy saliva from the mouth.

3rd. Existence on one of the faces of the tooth, and principally upon its crown, either of a blackish spot or cavity, according to the extent of the disease.

4th. The extreme pain the animal evinces when the tooth is struck.
5th. Swelling of gums; redness and pain around diseased tooth.
6th. Accumulation of food around the seat of disease, producing a repulsive odour.

Treatment of Caries.—The only remedy for caries is the extraction of the tooth, which is performed either with the forceps, or by trephining and punching the tooth out, the method to be preferred depending altogether on the case. After the operation, to stop the hæmorrhage, to modify the state of the membrane, and to guard against caries of the maxillary bone, the alveolus should be cauterized with the actual cautery, or in cases where this cannot be applied, a strong solution of argenti nitras applied with pledgets of tow or lint. The mouth should be cleansed with an acidulated gargle, and the animal fed on gruel and bran-mashes. On the day following the operation, a detergent, such as a chlorinated solution of soda, should be injected into the cavity, and afterwards a pledget of tow saturated with the same, should be introduced into the socket to prevent anything passing from the mouth to the sinus.

BARREN MARES.*

C. C. LYFORD, M.D., D.V.S. MINNEAPOLIS, U.S.A.

THE subject of sterility, or barenness in mares, is of vastly greater importance than one would at first be led to suppose. Only those who are actually engaged in the breeding business, or are professionally called to treat such cases, can comprehend the extent, as well as the serious nature of many of these complications. Besides, in a pecuniary point of view, it is of the greatest importance to the owners of studs, as well as of mares, as very often the most valuable animals used for breeding purposes are practically of no use outside of the harem, and as a consequence, are a source of expense without any returns; when on the other hand there should be a source of revenue, often of the highest character.

Successful fecundation is generally looked upon as a sure result of coupling the male and female sex at a certain period. Fleming says: "Successful fecundation, however, is

* Read before the United States Veterinary Medical Association, September 16th, 1891.

not always the case, and in some species, particularly the equine, sterility, temporary or permanent, in the female, is far from being uncommon, and is sometimes serious."

The same writer says that in the studs of France the fruitful mares are 59·57; at the Haras of Pin, during a period of twenty years, there was a percentage of 68·27 fecund mares, abortion 5·06. This would have about 64.82 to have colts. These figures indicate that only one-half, or at the most, two-thirds of the mares produce foals. Quoting from Fleming's Obstetrics: "Sterility may depend upon organic or physical causes, and may amount to permanent impotence, more particularly when congenial, and located in the generative apparatus. Monstrosities, hermaphrodites—animals in which one or more important organs of the sexual apparatus are absent, and hybrids are generally permanently sterile."

"Prolonged continence and old age are not infrequent causes of infecundity; as is witnessed in mares which have worked for many years in towns, and have then been transferred for breeding purposes." It may likewise be due, though temporarily, to premature or tardy coition, when the generative organs are not in a physiological condition for conception, or when they are in an irritable, abnormal state. Underfed or over-fed animals generally do not breed so readily as those which are in moderate condition—fat animals are especially unfruitful; excitable, vicious mares, are less likely to procreate than those which are of an equable and gentle disposition. The latter are often impregnated at one attempt; and it has been observed that with mares accustomed to work, active exertion, even to produce fatigue before being put to the horse, is favourable to conception. So it is that the Arab submits his mare to a severe gallop, and brings her almost breathless before the stallion, when, the act being accomplished, he leaves her quietly at rest for some hours.

I have known of one case where of a litter of six boar-pigs, four were fed on sugar and molasses to hurry up growth, after which all four proved to be barren, while the two that were turned out on ordinary feed were productive. Again, various diseased conditions of the generative organs, as well as general derangements, may also prove antagonistic to fecundity. There may be disease or alterations in the ovaries, Fallopian tubes, uterus or vagina, which will hinder conception; and if any material obstacle to the contact of the spermatic fluid with the ovule be present in these parts, fecundation cannot take place. Tumors of various kinds in this region are not infrequent cause of sterility. Rueff and others

have observed an imperforate, dense and tough hymen to be a cause of infecundity in the mare.

In all of these conditions, a careful examination should be made, as removal of the obstacle to generation may be quite within the scope of surgical or medical measures. More particularly is this the case when the obstacle is related to some abnormal condition of the cervix uteri—a circumstance more common than is generally supposed. In rare instances dilation may require to be effected by a cutting instrument, but this should not be resorted to until the simpler and safer means have failed.

Before taking into consideration the diseases to which the organs are subject, I will notice, briefly, the anatomy of the parts, both male and female, and their physiological functions.

Anatomy of the Organs of Generation.—The penis not only supports the greater part of the excretory urinary canal, but also transmits the sperm of the male.

The penis proper consists of the corpus cavernosum, extending to and forming the bulb, tapering gradually at the anterior extremity of the penis, occupying the upper surface and divided by a septum into two lateral halves; grooved on its under surface for the corpus spongiosum and urethra. The corpus spongiosum encloses the urethra, extending from the crura posterior and passing to the external extremity, which expands to form the glans.

Physiological Conditions of Copulation.—It will be necessary to describe the physiological conditions of copulation, to show upon what depends the normal action of the respective organs, male and female, during the act of coition. That the male organ, the penis, should be erect is necessary, and that the glans should vary considerably from its normal state is also essential. The enlarged glans should fill the transverse diameter of the vagina so completely as to withdraw and expel the air—thus forming a vacuum within the cervix and uterus; and in case the cervix is kept sufficiently open and retained in the centre of the canal, either by natural or artificial means, so that the urethral sinus of the glans shall fit the corresponding posterior surface of the cervix, and that the projecting end of the urethral tube may approximate most closely, or even fit into the opening of the os. Accordingly, should no obstruction exist between vagina and uterus, these conditions assure a complete injection of semen into the cervix and uterus; and as the glans assumes its natural size by its withdrawal from

the vagina, allowing air to pass into the uterus, it practically assures the access of seminal fluid.

It is evident that a variety of influences may interfere with the performance of the natural process of fecundation. For its accomplishment, four things are necessary.

First, The possibility of the entrance of seminal fluid into the uterus. *Second*, The possibility of the production of a healthy ovule. *Third*, The possibility of the entrance of the ovule into the uterus. *Fourth*, The absence of influences in utero destructive to the vitality of the semen, and preventive of fixation of the ovum upon the uterine wall.

Should these four conditions exist, no animal will be sterile. She may not bear a foal, but the incapacity may attach to the male and not to her.

The special causes of sterility, or those interfering with these conditions, may thus be presented:

First, Causes preventing entrance of semen into uterus: a, Absence of the uterus or vagina; *b*, Persisting hymen; *c*, Vaginismus; *d*, Atresia vaginæ, or complete obliteration; *e*, Occlusion of cervical canal; *f*, Conical shape, elongated cervix; *g*, Patulous os and flaccid or flabby condition of uterus; *h*, Endometritis, or leucorrhœa; *i*, Polypi, or fibroids; *j*, Flexion of uterus; *k*, Very small os internum; *l*, A curtain of membrane either, or both, external or internal to cervix; *m*, Equine syphilis.

Second, Causes preventing the production of a healthy ovule; *a* Chronic ovaritis; *b*, Cystic disease of both ovaries; *c*, Cellulitis or peritonitis, obliteration of Fallopian tubes; *d*, Absence of ovaries; *e*, Hæmorrhage into ovaries; *f*, Undeveloped state of ovaries; *g*, Atrophy of ovaries from old age.

Third, Causes preventing passage of ovum into uterus: a, Stricture or obliteration of Fallopian Tubes; *b*, Absence of Fallopian tubes; *c*, Detachment and displacement of Fallopian tubes.

Fourth, Causes destroying vitality of semen or preventing fixation of impregnated ovum: a, Corporeal or cervical endometritis; *b*, Membranous dysmenorrhœa; *c*, Menorrhagia or metrorrhagia; *d*, Abnormal growths; *e*, Areolar hyperplasia.

Absence of Uterus or Vagina.—I have met with but one case of absence of the uterus. During the summer of 1872, a young heifer showed signs of rut, and having a bull much larger than she was, it was not surprising to have her look droopy after copulation, especially as she was pushed through an ordinary board-fence at that time. The heifer was allowed

to stand around and attend to herself some three or four days, during which time she continually strained as if to urinate, occasionally passing a small quantity of blood. Having killed her about the fourth day, I made an autopsy, finding the abdominal cavity containing several gallons of urine, and a hole through the anterior portion of the bladder, showing that the penis had passed through the meatus urinarius and ruptured the bladder. Two small congested ovaries were found, but no uterus.

Persisting Hymen.—I have met with quite a number of cases of this kind, and in most of these it was thicker than natural; some of the cases requiring considerable force to rupture the membrane.

Vaginismus, or hyperæsthesic state of the os vagina, which results in spasms of sphincter. These cases are by no means rare, and are a common cause of sterility. It not only interferes with the entrance of the male organ, because of the pain induced, but prevents the seminal fluid from getting into the uterus, as the stallion in these cases is usually prevented making a closer cover, besides the spasmodic condition completely closing the cervix.

Atresia of the vagina is not very common in mares, and then follows laceration, or an organization of inflammatory lymph. These conditions, however, appear very common in cows; more often following the first calf than subsequent cases. The treatment is generally unsatisfactory, requiring instruments and surgical treatment which is often of no avail. The results being anything but satisfactory.

Occlusion of Cervix or Rigidity of Os Uteri. -According to Fleming, "occlusion of the cervical canal may be due to spasmodic conditions of the muscle and cervix. If, however, there be hypertrophy in this organization or rigidity, then an operation will be necessary."

Both rigidity and spasmodic condition of the os uteri are of very common occurrence, and are liable to be associated with many of the other troubles of the female generative organs. The spasmodic condition may be simply a consequence of irritation elsewhere. This condition is most common in young mares that have never conceived; but I have met with one case of rigidity when the mare was twenty-three years old, and was the dam of several colts. I have also met with the spasmodic condition in some cases during one heat, while at the next period it had entirely disappeared. This

will, I think, account for many of the cases which have been served repeatedly during a season, and all at once conceive by a single leap from another stallion, or even the same one.

Conical shape of Cervix and elongated Os Uteri is a very common cause of infecundity. By its bending on itself it may not admit the seminal fluid through the canal, and, as a rule, completely prevents it. This state of affairs not only causes trouble with the breeding of mares, but also in the human family. Thomas, on diseases of woman, says, "My experience leads me very positively to the conclusion that, excepting endometritis, this is the most common of all causes of sterility, and fortunately remediable." "The treatment recommended varies somewhat in the human family, with the length of cervix from dilation, bilateral operation and amputation." It is very apparent, with these conditions in mares that the cervix does not draw down and become flat and open, as it should do when the vagina "bellows up," or become rigid, as it should ordinarily during copulation. For these reasons, the cervix is left projecting into the vagina to the extent of two or three inches; consequently, the glans penis presses it to one side during the act of copulation, and there is little or no chance for the semen to get into the uterus. When the pressure is removed the cervix projects into the vagina, thus preventing the semen from entering. Here, I will say it is not necessary for the cervix to be tense and closed, for I have known many cases where the cervix was long, loose and flabby, with an opening sufficiently large to admit two fingers, and still the mare fail to conceive until artificial means were used. I wish to cite but two cases here of the tense or closed os:—one, Belvedere, by Mambrino Patchen; another, Gypsy Queen, by Polanius—and one case of elongated, patulous cervix in a mare of my own, Mabil H. 2:26, by Col. West, 2579. In regard to the first two cases, I will quote from the letters received concerning them. Byron G. Kimball, of Maple Stock Farm, Bradford, Mass., says: "The mare, Belvedere, I bought of William Trumbull, of New York City, for Col. H. A. Hale, of Bradford, and sold her at a sale in Boston, where she was bought by W. H. Phelps, of Minneapolis. I had bred this mare, according to my books, on an average of twice a month, for twenty-seven months, with Walter Hudson and various other stallions. I tried an impregnator on her, but it did no good. It was rubber, but more bell-shaped than yours." Dr. O. J. Evans, of Evansdale Stock Farm, Minneapolis, Minn., says: "Having used your impregnator on my Mambrino Patchen

mare, Belvedere, nineteen years old, that was bred by Mr. Henry Hale, of Bradford, Mass., to Warder, by Belmont and to Hudson, by Kentucky Prince, and by H. W. Phelps, of Minneapolis, Minn., to Bayardo, at least four times, all without impregnation, and having succeeded in getting her in foal during first heat by Red Chieftain, using the impregnator, and having used it on several other mares that had refused to breed one or more seasons, among them, Gypsy Queen, by Polanius, she being a mare, twelve years old, and had been bred to different horses at least four seasons without becoming in foal. I must also state that neither Belvedere or Gypsy Queen, had ever been in foal until this season, and both are now sure."

F. W. Muckey, Minneapolis, Minn., says, "I owned the bay mare Gypsy Queen, and bred her two years without success. I then sold her to J. K. Sidall, of Minneapolis, thinking her barren, as she was a young mare and we had used every means then known to the profession. Since then she has become the property of Dr. O. J. Evans, and I understand he has been unsuccessful until he used your "Impregnator," and with the first trial succeeded in getting her in foal." In regard to the case of elongated patulous cervix in Mabel H., she was a mare who at the age of five years had had a filly by Phallas 2.13¾. The next two years she was not stinted, but was returned to Phallas for the season of 1887 and 1888, but failed to conceive. In February, 1889, she was sent to T. B. Merritt's Farm at Rosemont, Minn., and was stinted to Nutwood Membrino until June 12th, without any good results. June 13th, 1889, I again had her returned to Nutwood Membrino, using an Impregnator, from which she conceived; the result being a chestnut foal, born June 13th, 1890, now registered Vol. X. Wallace Trotting Register as Woodnot 15234.

Patulous Os or flabby condition of the Uterus.—These cases are very common in mares, generally in those which have had foals or aborted, but are sometimes seen in mares which have never been in foal, or even stinted. The cervix is very loose and flabby, which is often more or less associated with a like condition of vagina and uterus; the os at times being so open as to admit the entire hand with little or no resistance. I had a case of this kind at the Bruce Stock Farm, Rosemont, Minn. The mare had aborted over a year before, since which time they were unable to get her in foal. She appeared otherwise in good health, worked every day and kept in good heart and flesh. I had the uterus and vagina flooded daily

for five weeks, using for an injection, alternate days, carbolic acid 1—100 warm water, corrosive sublimate 1—1000. This was continued until signs of heat returned the second time, when, after being stopped, her cervix was swabbed out with iodoform ointment 1—10, and the third day she was served. The os had so contracted that the large sized impregnator went in with difficulty, though the dilator was used. When examined before treatment, her cervix would admit with ease the entire hand, the uterus and vagina being especially flabby. The mare had since failed to receive another embrace, though repeatedly tried for over three months, and shows every indication of being in foal.

Another case of this kind was one of my own, Nellie Gray, Dam of Mabel H.; a mare twenty years old, having failed to conceive for five years—and having aborted six years ago—though being repeatedly stinted to various stallions before I purchased her in 1889. I had her stinted during the season of 1889 to Col. West, 2579, and during the season of 1890 to Morrel Tyrant and Greymont, the last two being young stallions, but to no avail. During the fall of 1890 I examined her, finding the cervix not only sufficiently open to admit easily three fingers, but the cervix was torn on its upper portion, and on the right side of *cul-de-sac* of the vagina from the vagina wall to cervix was a complete honeycomb; having evidently been lacerated at various times during copulation. Having decided to give her tonic treatment and regular exercise, she was left without further stinting until April, 1891, when I examined her and found the vagina and cervix nicely contracted and in heat. She was then stinted to a three year old son of Jersey Wilkes, from which she is now surely in foal.

Various modes of treatment have been tried for the lax, weakened condition of cervix and uterus, which may be classed as constitutional and local. The former class of remedies I have not given a thorough trial, though the cases on which I have used them indicate favourable results. These consist of general tonics, and especially stimulating and invigorating aphrodisiacs—such as phosphorus, cannabis indicus, nux vomica, ergot and arsenite of iron. Also saw palmetto Fld. Ext.

Local treatment, such as swabbing the cervix with tr. iodine and iodoform, as well as styptic, astringent, and antiseptic injections, have apparently proven beneficial in a number of cases.

I believe that electricity will prove itself very useful in

these cases, and specially where applied locally to the cervix, vagina, or uterus.

Endometritis fills the uterine canal with a thick tenacious mucus, and often prevents the entrance of seminal fluid or destroys its vitality. We meet with quite a good many of these cases in the mare, and they vary very materially in the consistency of the secretions. Endometritis and resulting leucorrhœa, are the most unsatisfactory diseases we have to contend with in the treatment of barrenness. In the first place, their treatment is far from being an agreeable task, and as the cases are generally of long standing when we get them, they are not only the more difficult to cure, but the time and expense often exceeds the value of the animal. The mare, as a rule is emaciated; she cannot stand hard work, and, though her appetite is often good, fails to put on flesh. The discharge is of a viscid, glassy or creamy character—often with a peculiar odour, which we require to smell but once to remember; especially in every case you get to attend at college, when you have to depend upon your fellow-students to assist you in treatment, particularly in the injections, the smell stays by you often for a day or more, no matter how often you wash or use disinfectants. I am glad to say that the balance of my cases have been looked after by the owners or persons in charge, though there is often a great deal of trouble to get them to follow your instructions, and obtain anything like favourable results. Mineral and vegetable tonics and mineral acids have generally proven beneficial. Also antiseptic injections, not too strong, also perox, hydrogen; though there is some danger of overdoing these. Unless the os is flaccid and well dilated, it is better to keep the parts open to allow drainage; as I have known of cases in which fluid was retained from one day to the next, the horns of the uterus often being relaxed.

Polpyi, fibroids and moles are not very common in my experience; having met with but three cases, all of them being outside of cervix, and were very easily cured by excision, and styptic and antiseptic dressings.

Flexion of uterus and cervix is not uncommon. In this the os is turned to one side, and during copulation it would be pressed against the wall of the vagina, entirely obstructing the passage to the uterus. Huntress 2·21 is said to be one of this kind; having been examined by R. C. Mason, V. S., of Winona, Minn., who reported the case to me as such a decided flexion that he was compelled to turn his finger almost at a right angle to get through the cervix.

Very small os internum. It is a common thing to find barren

mares who have been continually bred, and repeatedly opened by breeders, stablemen and even veterinary surgeons, without the inner portion of the os being dilated ; and at other times there is a membrane across the os internum which is not ruptured. As a consequence, they fail to conceive as effectually as if the membrane were over the vaginal surface of the cervix.

A curtain of membrane, either or both, external or internal to cervix.—A very interesting case of this type came under my treatment during the month of July, 1891. The mare was sixteen years old, and had failed to conceive, though stinted repeatedly at different seasons for the past ten years. I had known the mare some six years, she having been served by one of my own stallions during the year 1886 ; but I had given the case no special attention, and at that time knew nothing more than that she was claimed to be very tight by the man who dilated her os. She was given several leaps but did not conceive, and she was stinted every season following to different stallions, but to no purpose. She was then sent to Dr. Curryer & Sons' stud at Crystal Lake, Minn., with instructions to use the impregnator. The Doctor was unable to find the os uteri, it being concealed by folds of mucous membrane. I was called to examine the case, and found a fold of membrane reflected from upper vaginal surface of the os. Having passed one finger underneath the fold of membrane with a good deal of difficulty, I succeeded in dilating it sufficiently to get one finger through the cervix. I could then easily feel a second membrane at the internal opening of cervix, but my finger was not long enough, or the membrane was so strong that I could not tear it. By taking a small impregnator and dilator, which is about one inch longer than my finger, and passing it through the cervix until the disk of the impregnator came in contact with the vaginal surface of cervix, I then made a thrust by a pressure to the handle of the dilator at the same time turning it laterally. I then withdrew the dilator, leaving the impregnator in position. The mare, at once, by straining, threw off at least three pints of viscid, creamy fluid, which had no odour. I then had the uterus washed out, and this was continued daily until the appearance of heat returned some two weeks later. She was then served, using the small impregnator, and has since passed three periods or about six weeks, having been tried twice a week without any signs of returning heat. I simply wish to call your attention to the facts concerning this case. The mare had been repeatedly opened by parties who would generally

be considered competent judges, and capable of opening mares to breed. This mare had been so treated by several such men, besides having been examined by a graduate veterinary surgeon, who also used the small sized impregnator, having succeeded in placing it without the dilator. The external fold of membrane was reported, but the internal one was not noticed, and not being ruptured, there could be no chance of conception so long as it existed.

Equine syphilis has proven a great hindrance to breeding, by rendering pregnancy both uncertain and unsafe, and requires especial consideration; for which I would refer to W. L. William's article on equine syphilis in *American Veterinary Review*, 1888.

CLASS II.—*Causes preventing the Production of a Healthy Ovum.*—I will notice but one, atrophy of the ovum from old age and lack of use, as it will be seen by reference that none of these are curable diseases. I wish to note but one case, that of a black mare, record 2:53¼, belonging to me; I having bought her in 1887 to experiment on. She had never had a foal, though bred several seasons. After various trials, even by injecting semen through the cervix, she continued to return in heat, and in December, I decided to kill her and hold an autopsy. The uterus, vagina and cervix were healthy and in every way normal, but on examination of the ovaries, they were found to be pale and atrophied; showing no signs of graafian vesicles, or any indication of having produced any ovum for months, possibly for years.

III.—*Causes preventing Passage of Ovum into Uterus*, such as strictures or obliteration of Fallopian tubes, absence of Fallopian tubes, detachments and displacements, simply require mentioning to show how certainly they would prevent conception.

IV.—*Causes destroying Vitality of Semen or preventing Fixation of impregnated Ovum.*

a. Endometritis, corporeal or cervical, fills the uterine canal with mucus which either prevents the entrance of semen, or destroys its vitality, and has already been considered.

b. Abnormal growths of any kind which fill the uterine cavity, as for example fibroids, polypi, etc., may prevent attachments of the ovum to the uterus, even if impregnated.

c. Membranous dysmenorrhagia, menorrhagia or metorrhagia, and areolar hyperplasia, are seldom if ever seen in mares, hence will be given no further consideration.

MALE STERILITY.—Lack of erectile power in the male is

not uncommon, and varies with different stallions, as well as the same stallion at different seasons, or portions of the same. At the beginning of the stud season, many stallions fail to perform service with sufficient ardour, although they have been good coverers seasons previous. This may be caused by lack of tone from non-use, though at other times such a state of things follows certain diseases; such as catarrhal fevers, distemper and the like, as well as attacks of spinal meningitis. In other cases, the blood supply may be interfered with from partial or complete obstruction to one or more of the arteries supplying the penis.

During the spring of 1886, a stallion was brought to my infirmary with apparent paralysis of the penis; the parts hanging pendulous, and protruding about six inches. The season previous he had covered about sixty mares, and had gone into winter quarters in good shape; but during the winter he suffered from an attack of catarrhal fever, during which time his owner reported him badly swollen about the penis and testes, after which the penis remained pendulous. The stallion had already been blistered across the back several times. I applied electricity to the parts, which would at the time produce partial erection and so strengthen them as to enable him to withdraw them within the sheath; but he never regained power of erection or afterward performed stud service.

During the Spring of 1889, I was consulted in regard to a stallion, who, the previous season, had served forty mares, and was sold with a warranty of a sure foal getter; but, as he would not cover a mare at the beginning of the stud season, the party purchasing naturally suspected he had been cheated. I recommended as treatment:—Fl. Ext. Nux Vomica, Liq. Pot. arsenitis, Fl. Ext. ergot, and citrate of Iron, alternating with phosphide of zinc and sanguinaria. This treatment was continued but a short time when the animal's vigour returned, and there was no further trouble that season. I also had a case of my own, a four year old stallion, who had been a good coverer until the autumn of 1888, when I loaned him to cover some mares in the country, at which time he was kicked in the front leg and nearly died, as a consequence of erysipelas and distemper which followed. The following season I could scarcely get him to cover a mare, and then he invariably failed to get them in foal until the foregoing prescription was used, when he succeeded in getting all five mares in foal.

Absence of spermatozoa is not uncommon, especially in colts less than two years old, and as a rule at any age, should the testicles not appear in their natural locality, the scrotum.

In cryptorchids, as a rule, when neither of the testicles appear visible, no spermatozoa are to be found.

Old age is a common cause of impotency, but a great deal can be done to tone up these organs, and revive the natural functions by judicial use of some of the remedies which prove so beneficial in the lack of erectile powers.

Excessive length of penis is far from being an advantage either to male or female. Such stallions are seldom sure foal getters, and often injure the mare during copulation. I have found in these cases great advantage in using a shoe-boil boot as a washer, thus keeping six or eight inches of penis outside the vagina; and in many cases it has insured foals, where the stallion was considered not only unsafe to the mare, but uncertain as a foal getter. On the contrary, stallions with a short penis will cover a greater number of mares, and succeed in larger percentage of foals.

During the summer of 1882, I stinted two mares to Seneca Starr; he was a large horse with excessive length of penis and a very ardent coverer, though apparently not a sure foal getter. Having previously injured several mares, and killed one by lacerating the fundus of the vagina, I decided to try one by using a shoeboil pad as a washer. The move succeeded in getting her in foal at the first service. The other mare was stinted without making use of the pad, and though returned several times, did not get in foal, though she had been a regular breeder before, and had a colt by her side. The only mare in foal to Seneca Starr that season, was the one on which the pad was used. The next season, the pad was made use of in serving mares to him, and as a result he got some twenty mares in foal.

Weakness of Spermatozoa.—There is little doubt that the vitality of spermatozoa differs very materially in different stallions, as well as in different kinds of animals. I have at various times examined spermatozoa under the microscope from different stallions, after castration, as a rule, having a pail of water in which to place the testicles after removing them. By so doing they were all kept as nearly as possible under the same atmospheric conditions, the only difference being the length of time between subsequent castrations. When ready to make microscopic examinations of semen, I would lay the different sets of testicles by themselves outside the water, and put on a glass slide, under a top cover, a specimen from each set, and examine them at different intervals of fifteen minutes to one-half an hour. During the summer of 1877, I made a number of these experiments, and

invariably found the spermatozoa from one set of testicles would outlive the others; and, as a rule, those stallions whose testicles showed signs of injury, or inflammatory process showed less vitality; whereas the size of the testicle seemed to make little difference to the vitality of the semen, both being healthy. Small or medium sized testicles, as a rule, are less subject to injury, especially in stallions that are tracked or given fast road work. In one case particularly where specimens were examined, the animals having been castrated between eight and nine o'clock in the morning, on a moist warm summer day, the specimens were prepared and examined between nine and half-past nine that morning. I had occasion to show these to parties as late as five in the afternoon of the same day, and, to my surprise, the specimen from one set of testicles still showed vitality enough to move, while all the others showed no signs whatever of life.

I am of the belief that under favourable circumstances, if properly prepared, the semen of a stallion can be kept for several days; and that, at some future date, we will be able to send specimens of semen to be injected, instead of mares to be served. This would not only save the expense and time of shipping the mare, but a single service of a valuable stallion could be used to impregnate a number of mares, by which means a stallion could as easily get two hundred colts each season as fifty by ordinary methods.

The Different Instruments and Remedies now Advertised for Barrenness in Mares.

I present for your consideration these instruments, and principles indicating ideas of greater or less value; but all point towards one great principle—the dilation of the cervix and its retention in that position and centre of canal. To say that any one or all of the instruments can prove successful in every case, is an impossibility; though I am sorry that such advertisements as the following are to be found in our stock papers regarding one of them at least—"Barren mares made to breed regularly. *All* mares made to conceive at first service." This makes it practically non-professional, and is a poor recommendation for parties who endorse such statements. It may serve a special purpose in certain cases, but it is far from being infallible, and its claim is not only unjust and misleading to breeders, but unreasonable and erroneous. The Eureka dilator requires from six to ten hours for expansion; hence the mare must either wait or return for service the next day. It is the most expensive one of the kind in the market, as each service requires a new instrument.

The funnel-shaped instrument is practically out of use, on account of the great difficulty attached in placing it. The exceeding wide spreading end that is intended to pass through the cervix, has to be folded or rolled very tightly in order to get it even in a fairly loose os; and in cases that are at all constricted, less than to admit two fingers, it serves little or no purpose. Even should it be crowded into the cervix, it cannot expand, and is either thrown out by the mare, or works out during the act of copulation.

The Meddick pattern consists of a flat disk and a soft rubber tube; the latter surrounded by convolutions or flanges of rubber to retain it in position, and is held in shape by a hard rubber tube, small enough to pass through the others. This is too complicated to be practical, even if the convolutions were not a source of annoyance in removing it from the cervix, and in retaining filth, unless *every precaution* in cleansing and disinfecting is followed after each service. Besides, this is a hard rubber tube, which when in the least projecting, would subject the glans penis to more or less pain (if not injury), in proportion to the closeness of the cover and the ardour and impetuosity of the stallion.

As to medical remedies, those kindly sent by Mr. Wallace Banus for your inspection cannot be given a professional standing, on account of the misnomers under which they are to be recognised, not being represented either in Allopathic or Homœopathic medicines; consequently, they are shrouded in mystery, which injures their reputation—at least from the professional standpoint.

As to my own patterns of Impregnators and Dilators, Figures I., II., III., represent those which have been in general use for several years. The impregnators consist of a hollow tube

I.

II.

OLD MODELS.

III.

or cone, composed of soft rubber of sufficient thickness and firmness, to retain its shape and resist the pressure of the cervix. Somewhat constricted at the disk portion, that it may be self-retaining, the disk on the posterior surface is made so as to correspond to the urethral sinus of the glans, while the opening through the disk is sufficiently large to admit the projecting end of the urethral tube. The greatest difficulty is to make the two sizes meet all the requirements and variations of the cervix, as well as the peculiarities of the stallion, and the idiosyncrasies of the owner or attendant. In certain cases No. I. (small size) proves difficult to insert on account of the close tense os, but with the dilator this is quite easily obviated. In other cases, No. II. (larger size) may be too small to be retained, and requires a larger size.

Some stallions are especially sensitive while covering a mare—generally those stallions whose parts are larger than normal, or those having a big season, and are not very anxious when they find the least interference. To obviate these difficulties, I have to present you the new models of impregnators and dilators represented by cuts Nos. 1, 2, section No. 2, No. 3 and No. 4. They consist of the same size tube internally, so that a single dilator fits the entire set, while the external dimensions correspond to the size of the cervix anywhere from an inch to two and one-fourth inches in diameter, and from three and one-half to four and one-half inches in length. By section of No. 2, it will be seen that the disk (*a*)

NEW MODELS.

Section No. 2.

No. 2.

No. 4.

No. 3.

No. 1.

consists of a hollow air space as well as the bulb (*b*). The disk closely corresponds to the os in pliability, and the most sensitive stallions should fail to perceive the difference, and as a consequence make an equally close cover as when no instrument is used. The advantages in favor of the tubular variety of inpregnators, are the close approximation to the normal condition of the cervix during heat, rendering complete—as it does—the communication between vagina and uterus, thus assuring easy access for the seminal fluid, besides being easily inserted and ready for immediate use. They are *cheap*, as one *will last for years*, and they can be used in any number of cases.

Editorial.

THE AMERICAN CORN-STALK DISEASE.

In October last we drew attention to the discovery of a disease among American cattle sent to the Paris market, which, in some of its salient features, so closely resembled bovine contagious pleuro-pneumonia, that the experienced veterinary inspectors of La Villette were in doubt as to whether it was not that malady. The lungs of two of the affected animals were submitted to Professor Nocard, of the Alfort Veterinary School, who appears to have been impressed at the first glance with the resemblance of the lesions they presented to those of the serious scourge with which we are so well acquainted. But a closer examination of the organs showed that there were differences of a most distinct kind, and these we referred to in the article mentioned. Whatever doubts, if any, remained in the mind of Nocard after a macroscopical examination, he, as a thorough investigator, settled by a microscopical inspection and by inoculation experiments, and satisfied himself that the malady was not contagious pleuro-pneumonia, but one which had been carefully studied in the United States, in regions where that disorder had never been seen, and which, from its surmised etiology, is known across the Atlantic as the "Corn-stalk" disease, its appearance following the feeding of cattle on the heads of Indian

corn in a state of decomposition. We propose to give a description of the disease at an early date; in the meantime, it may be mentioned that, though the symptoms and lesions closely resemble those of the lung-plague, in this peculiar disorder there is found a bacterium which is absent in the former, and cultivations of it, when inoculated in other than bovine creatures, kills them. Nothing of this is observed in lung-plague, neither is there any evidence that the disease can be transmitted in a natural manner from an affected to a healthy bovine. Such is the conclusion Nocard arrived at from his researches, and such has been the opinion entertained for some time in the United States. For some years, American cattle have been arriving in this country, and at times they have been condemned as affected with the lung-plague, but, strange to say, not a case of this "corn-stalk" disease has yet been discovered among the hundreds of thousands imported; while in France, which has only been receiving these cattle for a short time, three cases of the American disease have been met with, but not one of contagious pleuro-pneumonia. It must be acknowledged that there is something curious in the circumstance of cattle arriving in this country from the United States affected with the lung-plague only, while those reaching France from the same region show nothing of that scourge, but a disease special, so far as we know, to trans-Atlantic countries.

But doubts have been expressed as to whether the lung disease observed among the American cattle imported into England, is really contagious pleuro-pneumonia; and indeed so convinced is the United States Government—acting on the information of its veterinary advisers—that the cattle exported are free from that disorder, that it has stationed its own veterinary officers at certain of our ports, in order to see that no mistake is made. More than once there has been a dispute among our own veterinary authorities as to the nature of the malady for which United States cattle were condemned—one side asserting it was the veritable lung-plague, and the other as confidently maintaining it was not that malady, but broncho-pneumonia, the very name Nocard gave to the disease he investigated. Quite recently, in a cargo of American cattle landed at Deptford, *one* was condemned as suffering from the contagious scourge, but the American veterinary surgeon was opposed to that view, and we presume he had experience in that disease, as well as the one enzootic in his own country. This case appears to have given fresh life to the dispute, and the matter is being vigor-

ously, if not acrimoniously, discussed as to whether the lesions in this animal's lung were those of contagious pleuro-pneumonia or the Corn-stalk disease. It does seem strange that no steps were taken at the moment, to conclusively verify the opinion of one side or the other, by resorting to the same procedure that Nocard adopted; for that such was necessary in order to satisfy himself and the French Government, he at once perceived. Such a course probably would or should have settled the business, which threatens to assume the dimensions of an ugly international dispute. We ought surely to have men in our profession in this country who could ascertain what is the nature of a bovine lung disease, without having to send a portion of morbid, and possibly greatly altered, lung, travelling over Europe for the opinion of Veterinary professors who had only seen the one disease—never the other—and could have no really authentic proof—such as would be demanded in a law court—that the morbid specimen was derived from the American ox in question. We have seen bacilli which, we were informed, were found in the diseased lung, and they certainly appeared to correspond with those described by Nocard in France, and Billings in America, as characteristic of the Corn-stalk disease, and we have been assured that their identity is further established by their peculiarity in staining. What is required to complete this identity, are cultivation and inoculation, and if another case of this kind occurs among imported cattle, this should be done. There need be no rude personalities, or attempts to appear clever at the expense of others introduced into such a question; nor need veterinary surgeons in this country be made the laughing-stock of their Continental colleagues, by confessing they cannot distinguish one well-known disease from another without their help.

It must be remembered that the United States' veterinary surgeons deny that cattle affected with contagious pleuro-pneumonia are exported from their country to ours, and on this point they are particularly emphatic. In the *American Veterinary Review* for November last, there is a strongly-worded editorial article on this subject which deserves careful notice, and in which the following remarks occur: "It has always been asserted, and truthfully, so far as we can yet learn, that contagious pleuro-pneumonia has at no time existed in the cattle-producing area of this country, but has been limited to the dairying districts of the Atlantic seaboard, to a few isolated herds of breeding animals—mostly

Jerseys—in some of the Western States, and these were derived from the Eastern dairying districts; and to the well-known outbreak among distillery cattle and dairy cows in Chicago. The disease has not found entrance into the current of the beef-cattle traffic of this country, and there is good reason for believing that it never will. This has been positively asserted and re-asserted; and yet English veterinarians have openly disbelieved us, and to prove that we are either incompetent, or dishonest, have persisted in finding contagious pleuro-pneumonia (?) among our export cattle landed on their shores, and stoutly maintained the correctness of their opinion against our assertions, that it was the genuine dreaded lung-plague which they had found." While anxious that this question of lung-plague introduction into this country from America should be solved amicably and satisfactorily, we must observe that so long as the United States have that destructive scourge within their borders, they must be kept on the same footing as we are obliged to treat other nations whose cattle are infected by it—this is only fair and reasonable. What should be observed is, that cargoes of cattle arriving here ought not be condemned as infected with a serious disease, when it is a non-contagious one of a different kind. As a profession laying claim to scientific knowledge, we all have an interest in the solution of what is at present a pathological problem. And it needs only to be examined in a scientific spirit and good temper, to receive this solution.

ON "IMMUNITY FROM DISEASE." *

BY D. J. HAMILTON, PROFESSOR OF PATHOLOGICAL ANATOMY, ABERDEEN UNIVERSITY.

PROBABLY coeval with the time when the various infectious and contagious diseases became a well-established inheritance of mankind, it has been matter of common observation that, in the large majority of cases, the afflicted individual, after recovery, enjoys a more or less complete immunity from a future attack of the particular disease from which he or she has suffered. The acquired immunity lasts from a few months up to the greater part of a lifetime. In the case of practically all the *infective* diseases more or less immunity is conferred, the period of exemption varying according to the malady and the idiosyncrasy of the individual. We know, as an everyday experience, that, having suffered from measles in childhood, we may fairly look forward to being exempt from that affection. The same holds good, although to a minor extent, of scarlet fever, typhoid, and typhus; and, in the case of small-pox, it is rarely that the disease shows itself more than once in a lifetime. There are excep-

* Introductory Lecture delivered at the opening of the Winter Session, Aberdeen University, 1891-92.

tions to this rule, but so few as almost to warrant, if a person has once suffered from measles or small-pox, that a complete immunity from these diseases will be enjoyed for all time coming. Curiously, when a second attack does occur it is sometimes of a most virulent character. Some of the worst cases of small-pox show themselves in persons already pock-marked through having suffered from the malady in early youth. In many *contagious* diseases of man and the lower animals, and by contagious I mean such diseases as are conveyed from host to host by actual and immediate contact with the virus and not through the intervention of the atmosphere, a like immunity is enjoyed after a first attack. In fact, there is a legitimate presumption of immunity being conferred in the whole of them, with this qualification, that the truce enjoyed varies in point of duration and is comparatively short in some. But there is another equally self-evident fact bearing upon this subject, namely, that certain species of animals are *naturally* protected against infectious and contagious diseases to which others succumb. Thus many of the diseases of this class having their stronghold in the system of man, are unknown as diseases of the lower animals and *vice versâ*. To recall this to your memory, I have only to mention typhus, typhoid, scarlet fever, or cholera. All of these are diseases which, so far as we know, have their habitat exclusively in the human race; while some which are highly infectious in the lower animals are not communicable to man. On the contrary, tuberculosis, anthrax, and many others are common to man and the brute creation. What is more remarkable, however, is that, even among warm-blooded animals not so very far removed in kinship, and even in certain species of a particular genus, there are to be found some noted instances of immunity. The ordinary sheep takes anthrax readily, but Algerian sheep are almost completely protected. There is no animal so easily inoculated with anthrax as the common mouse, yet it is with the greatest difficulty that the disease can be conferred upon the rat. The dog, fowl, and the pigeon, in like manner, are extremely refractory to anthrax, if they can be made to take it at all.

Tuberculosis.

Of all contagious diseases to which the vertebrate creation is liable, tuberculosis is that which covers the widest field. Not only is it a scourge of the majority of mammals, but even reptiles have been found not to be exempt. Yet even in the case of this all-prevailing affection, there are certain mammals which are peculiarly refractory to it, although they can hardly be said to be free. There is perhaps no animal that so commonly falls a victim to its ravages as the milk-cow. From a recent statement it seems that twenty per cent. of our dairy cattle yielding vendible milk are affected with tuberculosis, and that four per cent. of these suffer from tubercle of the udder—a statement sufficiently alarming to inspire the most foolhardy amongst us with terror in the use of what heretofore was considered one of the blandest and least harmful articles of diet.

Early Attempts to Secure Immunity.

Seeing that immunity from infectious or contagious maladies has been matter of common experience for so long, it might be expected that attempts, however empirical, would have been made to acquire the coveted habit of body by artificial means. Such has been the case. Among the earliest adopted was that of inoculation for the small-pox from an individual suffering from a mild attack of the disease. Inoculation for this disease has been known and practised in the East probably for centuries. The practice originated most likely with the Arabian physicians, and became a common one in Bengal, Circassia, and China. It was carried to Mecca by Mahomedan pilgrims, and thence found its way to the districts round about. Among the

Turks and Circassians it became a recognised preventive. De la Motraye in 1711 saw the operation performed upon a Circassian girl four or five years old. An old woman performed the operation. The girl was taken to a house where a boy lay long ill of the disease, and in whom the pocks were ripe. The operator took three needles fastened together, and pricked the skin of several parts of the body. She next transferred some of the discharge from a pock to the bleeding punctures, which she covered first with dried angelica leaves, and afterwards with the skins of young lambs. The mother having packed her daughter in a skin wrapper, carried her thus enveloped to her own house. The patient was kept warm, and was fed only upon a pap made of cummin flower, to which was added water and sheep's milk. With these precautions, and upon this regimen, De la Motraye was assured that the small-pox generally came out favourably in five or six days. The operation was introduced into England from Adrianople by Lady Mary Wortley Montagu in the year 1717. For long previously, however, it had been known and was practised in Scotland and Wales. The method thus introduced in course of time was widely accepted, and finally even Royalty became a convert to it. In the year 1772, the Princess of Wales, being desirous of having the two young princesses inoculated, ordered it to be performed upon some charity children! Shades of anti-vivisectors arise! We cannot do such things now-a-days on rats or mice! The success of the experiment was so great in the case of these unfortunates that both the princesses were subjected to the operation. The result in their case being also satisfactory, the Princess of Wales herself, cautious woman, was finally inoculated, and successfully. The fashion having thus been set in the highest quarters became the rule among persons of meaner rank. The procedure, however, at the best was far from satisfactory, for, although it certainly conferred protection against natural small-pox, and although the disease communicated by inoculation usually ran a mild course, yet there were some melancholy exceptions to the rule. The disease often asserted itself in all its virulence when thus artificially conferred, and the proceeding ended in the forfeiture of the patient's life. The practice, accordingly, fell into disrepute, and, ultimately, was abandoned on Jenner's immortal discovery of vaccination.

Vaccination.

Vaccination was, from its commencement, and, indeed, still is, a purely empirical proceeding. We have no conception how it acts, nor are we agreed about the relationship between cow-pox and the small-pox of the human subject. Numerous as have been the assays to confer small-pox upon the cow, it may be affirmed that all have proved signal failures. This of itself would seem to show that cow-pox is not small-pox modified by being passed through the system of the cow, as was asserted; but that it is a distinct although perhaps allied disease. It nevertheless has the power of conveying immunity. We have no knowledge of how the serous exudate from the vaccinia vesicle renders the system refractory to small.pox; but we employ it empirically to the very best purpose. There is evidence to show, however, that we are not to be long in the dark in regard to the hidden means whereby this and other protective remedies act. Recent discoveries in bacteriology have thrown a promising, if as yet not very certain, light upon the whole subject of immunity. Ushered in as they were by the experiments of Pasteur on Anthrax, we may now say, at least, that a most hopeful path has been struck, which, if followed up, will probably lead to the most brilliant practical issues. At the same time I would deprecate any attempt to persuade the lay public that great utilitarian issues are at once to flow from work of this kind. We have lately had a melancholy example of the evil consequences of this restless expectancy, in the craze about *tuberculin* and its wonderful so-called "cures." Remember

this, gentlemen, we medical men do not *cure* diseases. The word is detestable when employed on the understanding that we do; and the older you grow. and the more experience you get, the more you will appreciate the force of this remark. All that we do in treating disease is to remove hindrances to recovery, thus enabling nature to assert its normal state of equilibrium. The living organism always tends to a certain average condition of equilibrium, and it is in a knowledge of what the disturbing causes of this are, and how to remove them, that the science and art of medicine consist. The *vis medicatrix naturæ* does the rest.

International Congress of Hygiene.

At the recent International Congress of Hygiene held in London, the subject of "Immunity from Disease" formed, perhaps, the most absorbing of the many topics of debate. And chiefly was this so from the inherent interest which it possesses, and the freshness and pertinency of the recent discoveries relating to it.

Early Attempts to Produce Vaccines.

The earliest attempts in the preparation of vaccines (*sic*) artificially were directed to attenuating the virulency of the microbes which are the cause of contagion, and it is only some ten or eleven years ago that these efforts were crowned with anything like success. The fact that a disease microbe may be possessed of different degrees of virulency, and that when in an attenuated condition it may still be used as a vaccine, was first demonstrated by Pasteur in the year 1880. In a note to the French Academy he described how the virus of fowl cholera, a peculiarly destructive form of malady in poultry-yards round Paris, can be attenuated by long exposure of an artifical growth of the organism to air. The potency of the most virulent form of this microbe, if cultivated on chicken broth for three, four, five, eight months, or more, becomes so diluted that perhaps only one in ten animals dies after being inoculated. A stage is at length reached in which the virus does not kill, but nevertheless acts as a vaccine. The prolonged contact with atmospheric oxygen is apparently the attenuating agent.

He afterwards found that the organism of anthrax, one of the most noxious of the class of diseases under consideration, when cultivated at a temperature between 42° and 43° C., and with free exposure to the air, in like manner, daily loses part of its virulence, until, by the ninth day, it becomes inert. When arrested at a particular stage, however, the attenuated anthrax organism is still sufficiently powerful to confer immunity upon an animal inoculated with it, and, as a matter of fact, this attenuated anthrax has, for several years back, been in daily use throughout France, as a prophylactic against that malady in sheep, and with the very best results. If virulent anthrax is inoculated upon such a vaccinated animal, the organism may germinate locally at the seat of puncture, but fails to disseminate itself throughout the blood. It behaves, in fact, very much as many of these bacterial poisons do when introduced into a naturally refractory animal.

Similar results in the attenuation of anthrax can be obtained, but not with such certainty by prolonged exposure at a high temperature, by passage of the virus through a different species of animal, and by other means.

Chemical Vaccination.

Of late, however, another method, introducing a new principle, has been discovered—namely, that of removing or destroying the organism and utilising the chemical products secreted by it for vaccinating purposes. This is now termed "chemical vaccination" in contrast to the former, which is usually known as "microbic vaccination." The method was formerly used by Pasteur for *choléra des poules*, but recently has been put to experimental proof at the

hands of Salmon, Wooldridge, Beumer, Charrin, Chamberland and Roux, Fraenkel, and others. The general result bears out that in order to render an animal proof against, let us say, anthrax, it is unnecessary to employ the organism itself. All that is required to gain the desired state of immunity is to inject subcutaneously, or directly into the blood circulation, the chemical products or toxines formed by it either in the living blood or *in vitro*.

The means employed for separating the organism have been various. Among the earliest was that of filtration through porcelain. This method, so far as the arrestment of the microbes is concerned, is perfect; but it is not otherwise faultless, in so far as some of the chemical products adhere to the surface of the filter. Heating up to a given temperature has also been put in use, but the procedure is not only liable to leave some of the microbes uninjured, but is likely to destroy the chemical substances it is desired to retain. The procedure which, in the hands of Roux and de Christmas, has proved most serviceable is the mixing of certain essences, such as those of garlic, mustard, or eucalyptus with the blood or artificial culture. These essences have the effect of destroying the vitality of the organisms but of leaving the chemical products unimpaired. They are volatile, and consequently can be evaporated *in vacuo*. Anthrax blood when thus treated, is rendered harmless, as a means of conveying the disease, but its introduction into the system of an animal like the sheep, confers immunity more or less durable. It is calculated, however, that the immunity gained by this "chemical vaccination" is less lasting than that conferred by the introduction of the attenuated microbe itself, but that the procedure is not so dangerous. With the latter there is always the risk of the organism regaining its pristine virulence, while with the former this danger is superseded.

Cause of Immunity.

It being now accordingly admitted on all hands that immunity can be artificially acquired through various means, and as we all know that some animals are naturally immune against certain distempers, the question of present interest is how this resistance of the system is brought about. The matter as yet is *in transitu*, but so far as I have been able to gather from the discussion which took place at the Congress, as well as from the somewhat voluminous literature bearing upon the subject, there appear to be two main views entertained by those who have devoted special attention to its investigation. The one is that in an immune animal the blood contains a chemical substance which destroys either the microbes of the disease or their toxines; the other, that it is the phagocytes of the blood and tissues, which exert this preservative or defensive action. Let me state to you the facts and arguments on both sides of the question.

Beginning with the chemical argument, if we may so designate it, the experiments of Nuttal (1888) went to show that fresh blood or blood-serum destroys microbes of different kinds, and that this action cannot be accounted for by the presence of the living cells of the blood, but must be due to something which is dissolved in the blood-liquid. Later experimental evidence (Hankin, Buchner, Roux. &c.) has entirely borne out this statement. There is a something contained in the blood-serum of warm-blooded animals which has a destructive effect upon a vegetable organism, such as that of anthrax. In half an hour after mixing anthrax bacilli with fresh defibrinated blood a large number of them will be found to have perished. It does not prove fatal to the whole of them, but, as accurate counting of culture colonies shows, a large proportion of the bacilli have been deprived of their vitality. The remainder, if left, may continue to grow. The blood or its serum in a few days loses this influence completely, so that, as is well known, it comes to constitute one of the best culture media which we possess. If this is the case with the blood of

an animal not refractory, say to anthrax, it ought to hold good still more so of an animal which is known to be naturally refractory to the disease.

As I before mentioned, the rat, and especially in its adult state, is peculiarly immune to anthrax, and, accordingly, Behring, Hankin, and others have made its blood the subject of observation in the above relationship. So powerfully bactericidal does the rat's serum appear to be, that even when the *spores* of anthrax, whose vitality is much more difficult to destroy than that of the *bacilli*, are added to rat's serum, large numbers of them perish, and frequently so universal has the destruction been that the serum containing the spores fails to give any further culture. When mice are inoculated with anthrax spores previously mixed with the serum of the rat, the disease either developes slowly or not at all. The rat's serum, therefore, acts as a veritable antiseptic upon the anthrax organism in its most dangerous forms. The blood-serum of the dog and frog, according to Ogata and Jasuhara, have a similar and perhaps more powerfully lethal action upon this organism.

Not only, however, is this found to be so with the blood of naturally immune animals; it also holds good of that from animals in which the immunity has been artificially acquired. Thus Bouchard found (1890) that the serum of the rabbit forms a good culture medium for the bacillus pyocyaneus. If, however, the animal be previously rendered immune to this microbe by inoculation of the organism upon it, its serum either delays the growth and attenuates it, or proves absolutely negative as a culture basis. With other organisms the same has been found to hold good. If the serum is dialysed in distilled water, so as to remove the salts, the property is lost. The salts themselves, however, have no power in retarding the growth.

The blood-serum of a non-refractory animal, and more especially of one which is refractory, has therefore a more or less well-marked bactericidal tendency, and it evidently contains a soluble substance which confers this influence upon it. Its bactericidal properties, moreover, appear to be forthcoming, not only when the experiment is made *in vitro*, but also when the refractory serum is injected into a susceptible host. So much so is this the case that Ogata and Jasuhara assert that a single drop, or even half a drop, of blood taken from the frog or dog, if injected subcutaneously into the mouse, not only preserves that animal from anthrax, but will do so up to a period of five hours after infection. A like result has been obtained in pig typhoid by Emmerich and Mastbaum using the blood-serum of the rabbit previously made immune to the organism of this disease.

Defensive Proteids of the Blood.

What, then, is it that is contained in the serum, and which exerts this powerfully antiseptic influence? Opinion now seems to be pretty well at one in regarding the bodies which have this effect as of the nature of ferments. As they are present only in small quantity, it is extremely difficult to isolate them pure and in such mass as to ensure an accurate analysis. Hankin and Buchner have, however, succeeded in separating them. The former calls them "defensive proteids," the latter "alexines." Hankin has derived them not only from the blood, but also from the spleen and lymphatic glands, and both he and Buchner are agreed that they result from the metabolism of different cells throughout the body. They are freely soluble in glycerine, although not in alcohol or ether. According to the chemical doctrine, therefore (as enunciated by Hankin), immunity, whether natural or acquired, is due to the presence in the blood and tissues of these bactericidal defensive proteids. The animal which is receptive to a particular microbe contains little if any of the necessary defensive proteid, while in the blood and tissues of that which is refractory it is abundant. We might even go a step further, and say that when recovery takes place after an attack of a contagious malady, the system has risen to the

occasion, has thrown out defensive proteid sufficient to destroy the life of the microbe, and thus has arrested the progress of the disease.

But in symptomatic anthrax, diphtheria, and tetanus the respective organisms do not spread broadcast through the body; they are confined to the point of inoculation and its neighbourhood. How is it that the system preserves itself against their deadly influence when rendered immune? How is it that recovery from them ever takes place? Toxines are abundantly secreted at the point or points where the particular microbe has gained entrance, and are disseminated far and wide. An animal can, nevertheless, become immune against these diseases as well as against those in which the microbe actually fructifies in the blood. Light has been thrown on this anomaly by the discovery of Behring and Kitasato that the blood of rabbits vaccinated against tetanus possesses the power of neutralising the tetanic toxine which finds its way into it and in this way confers immunity.

Continued Immunity.

It would thus seem that the blood can be rendered proof against invasion either by microbes themselves or by their poisonous chemical products. *Defensive proteids* or alexines, according to Buchner, are capable of living for some time after being introduced into the system. It is hardly possible, however, that immunity, extending over many years, can be accounted for in this way. It seems more likely that the cells of the body, having once been brought face to face with the enemy, acquire in course of time the power of secreting defensive proteids in increased quantity.

Phagocytosis.

Such being a condensed statement of the main facts of the chemical side of the question, we now come to the other or "microbal argument." It was for long a mystery how the larval batrachian tail and gills became absorbed. A solution of the difficulty, however, was afforded by Metchnikoff a few years ago. Cells possessed of amœboid movements, and known as phagocytes, invade the textures in process of absorption, return with fragments of them to the living parts, and in course of time digest them. These phagocytes can be seen bearing away pieces of nerve, muscle, &c., intussuscepted in their protoplasm. The little crustacean or "water-flea" Daphnia is subject to a parasitical disease in which the parasites can be easily distinguished. Metchnikoff noticed that the phagocytes seize upon the parasites and remove them. Taking this as the key to a particular line of inquiry, he has extended his observations to the parasitical diseases of warm-blooded animals, and after much laborious research has formulated the theory that these phagocytes are in reality the defenders of the body against organismal invasion.

Phagocytes may be derived from different sources. The most of them are the colourless corpuscles of the blood, but endothelial, giant, and other cells may also assume, under certain conditions, this protective influence. In a bacillary disease, such as anthrax, the colourless blood corpuscles may occasionally be seen loaded with rods.

As bearing upon this doctrine of protection, Metchnikoff states that the more contagious or infectious a micro-organism proves to be the rarer is its presence within phagocytes. The more refractory the animal is to its influencc the more rapidly is it absorbed by the phagocytes, and thus disposed of, while if the system of the animal does not resist, if infection is rapid, the microbes remain free.

But not only is it neeessary, in order to ensure safety, according to this view, that the organisms be incorporated by the phagocyte; they must also be digested by the juices of its protoplasm. When a number of parasites have been enveloped in the protoplasm of the phagocytes some of them begin to

show indistinctness of outline, and fail to stain with aniline dyes as they do when first engulfed. The explanation of this is that they are becoming digested just as the particle of nerve or muscle is digested in the absorption of the batrachian tail.

There are many facts which in a manner lend colour to this doctrine of phagocytosis. It is well known to you as young surgeons that a granulating wound is much less dangerous as a source of organismal absorption than one which is fresh. Putrescence may be rife in the neighbourhood of the former without danger of exciting pyæmia, while in the latter the danger is extreme. The explanation is said to be, that the granulation cells oppose a successful barrier to the entrance of the septic organisms on which this disease depends.

Another curious fact is that, if a foreign body capable of being absorbed or likely to prove harmful to the system, is placed within the tissues, it rapidly becomes enveloped by a layer of cells which Metchnikoff holds to be phagocytal in their function. So rapidly does such a body become surrounded, that in a few hours after its introduction the adjacent tissues are swarming with embryonic tissue. In course of time giant phagocytes appear upon the scene, and become flatly applied to the surface of the foreign body, often scooping out an actual cavity at the point of contact.

Chemiotaxis.

There is, however, some difficulty in accounting for the phagocytes getting hold of the microbes, more especially when the latter are sparsely scattered throughout the blood. The explanation given by Metchnikoff, Roux and others of the Pasteur school to meet this difficulty, is that the microbe, under certain conditions, exerts an attractive influence upon the protoplasm of the phagocyte—a power which in other observed instances has been termed "chemiotaxis."

This notion originated in the relative observations of Pfeffer on the zoosperms of ferns and mosses. As shown by this observer, solutions of malic acid attract the zoosperms of ferns, while saccharose is the attracting agent for those of mosses.

Massart and Bordet allege that the products secreted by microbes exert a like attractive sway or "positive chemiotaxis" over leucocytes, a fact which *faute de mieux* has been eagerly seized upon to account for the phenomena of microbal phagocytosis. The substance which possesses this esoteric influence is said by Buchner to be of a proteid nature, while Roux supposes it to be represented in the poisonous toxines. Lactic acid, it may be mentioned, has a decidedly repulsive or negative chemiotaxic action on leucocytes.

Summary of Doctrine of Immunity by Phagocytosis.

The whole doctrine of *acquired* immunity, as held by the Metchnikoff school, may now be stated briefly as follows :—The products formed by microbal agency can exert an attractive or a repulsive influence upon phagocytes. When a virus is introduced through the skin, it germinates at the seat of puncture and there forms substances which attract leucocytes. The more active the virus the more energetic are the poisons it secretes. If the poison be very abundant and powerful, it may actually paralyse the amœboid movements of the phagocytes so that they become incapable of enclosing the microbes in their neighbourhood, which latter, consequently, are sown broadcast throughout the system. This is the case, for instance, in *choléra des poules*, where the organism spreads diffusely, and where there is no appearance of phagocytosis.

If an animal is successfully vaccinated against the particular microbe employed for experiment, it is supposed that the phagocytes have become inured to the paralysing action of the poison. The phagocytes which arise for defence purposes in a barrier round the point of germination, are conse-

quently proof against even a large dose of the poison, or are not influenced to such a degree as to destroy their phagocytal properties.

On the other hand, *natural* immunity is traced to various extraneous circumstances, such as temperature, the reaction of the blood, the thickness of cellular envelopes, &c.; while, in other cases, it is possible the cells of the body possess a natural resistance against microbal poisons, just as we find it to be the case with the nerve cells of certain animals against morphia, belladonna, strychnia, &c. The latter argument, however, savonrs somewhat of begging the question.

Altogether considered, there is a weakness about the phagocyte theory that it will require much further demonstration to overcome. Even the most strenuous supporters of *chemical vaccination* do not deny that phagocytosis does occur in bacterial diseases. What they uphold, and I think rightly, is that, as yet, it has not been proved to be sufficient to account for the phenomena of immunity. For, even granted that refractory animals exhibit phagocytosis, while in the non-refractory it is absent or ill-marked, there is always the possibility that its presence is simply the result not the cause of immunity—that, in fact, it is merely an epiphenomenon of the immune state. Phagocytes absorb all sorts of particulate matter besides microbes, and the explanation of their enveloping more bacteria in the immune than in the susceptible animal, may simply be that the conditions are more favourable, either from greater time being afforded, or from ulterior causes.

INOCULATION OF ANTHRAX INTO THE CENTRAL NERVOUS SYSTEM.

MARTINOTTI and Tedeschi *(Centralbl. f. Bakt. u. Paras.*, November 7th and 18th, 1891) relate and explain experiments in which they made a small trephine hole through the skull or spinal column of animals with strict asepsis, and injected the infecting fluid into the frontal lobe or lumbar cord, as the case might be. The blood, the fluids of the brain and cord, as also the spleen, were examined. Very susceptible animals died more quickly than when inoculated elsewhere. Also other animals not completely immune soon died. A piece of the brain thus infected and placed beneath the skin, killed more rapidly than anthrax cultures or the most virulent blood; thus the virulence of anthrax is increased. A watery emulsion of the brain injected beneath the skin acted in like manner, but if sterilised was without effect. The changes in the nervous centres were variable, but sufficiently definite. There was a great multiplication of the bacilli, more especially in the ventricular cavities, subarachnoid spaces, and central canal. A large number of white and red blood cells were found in varying proportions in the ventricles and meninges. The epithelium of the lateral ventricles was often detached, and the vessels much engorged. There were but few bacilli in the nervous tissue itself, and then only when necrosis was present. Except in cases where bacilli were found generally throughout the blood, they were absent from the cerebral vessels, even though abundantly present in the meninges and ventricles. In the lymph channels of the vessels, and especially of those penetrating from the meninges into the cerebral cortex, increased numbers of bacilli were observed. The lymph space was surrounded by necrotic brain tissue, as if the result of some corroding liquid, and most probably the effect of the fluid in which the bacilli and their products abounded. The nerve cells were the first to be affected, whereas the connective tissue and vessels would still maintain their normal appearances. There was cerebral œdema, with a characteristic opacity of the nervous tissue and a widening of the spaces containing the nerve cells, but no exudation of leucocytes as in the

meninges. In the spleen the Malpighian follicles were swollen. The enlargement of the spleen itself depended on the duration of infection. Evidence of phagocytosis was seen in some cases. Some of them contained as well as some of the free bacilli stained well, others irregularly (not spore formation), and others not at all. The authors are inclined to think this defect in staining was due to the unsuitable medium formed by the spleen for the bacilli. The rapidity with which animals not susceptible to anthrax died when inoculated as above described now remains to be explained. It would appear that anthrax bacilli in contact with nervous tissue can give rise to toxic substances which lessen the resistance of the individual.—*British Medical Journal.*

BONE DISEASE IN GOATS.

At the last meeting of the British Medical Association, held at Bournemouth, after a paper had been read by Mr. Eve, on senile changes in bone, Mr. Spencer referred to some cases of a peculiar disease which he had described as occurring in goats in which there was (1) deformity produced by enlargement, (2) softening, (3) a new growth having the structure of osteosarcoma. The disease first noticed by Varnell in horses, aud sometimes called "osteoporosis" by veterinary surgeons, was found to occur in goats from 6 months to 3 years of age, coming from the neighbourhood of the Brown Institution in the south-west of London, exclusively within the months of February, March, April and May. The disease commenced by a symmetrical swelling of the angles of the lower jaws, which continued to increase until rumination was prevented, and the animal died. The disease affected also the upper jaws, skull, and epiphysial ends of the bones. Also in some cases during the disease there occurred a change in the joints similar to that described by Dr. Legge in hæmophilia. All the bones of the skeleton could be cut with a knife. The change was a replacement of the bone and marrow by a tissue microscopically resembling osteosarcoma. He regarded it as a disease intermediate between osteteitis deformans, osteomalacia, and osteosarcoma of bone. With regard to the atrophic and hypertrophic changes occurring in the skulls shown by Mr. Eve, he thought that the chief factor was vascular change; in the case of atrophy, due to the diminution of the blood supply comparable to senile gangrene: in the case of hypertrophy from increased blood supply.

TUBERCULIN AS A DIAGNOSTIC AGENT IN TUBERCULOSIS.

In the December issue of the *Journal*, we gave a brief notice from the *British Medical Journal*, of Professor Nocard's test experiments with tuberculin in Paris. We have now received a full report of the paper on this subject, which he read before the Académie de Médécine, and of which the following somewhat condensed notice will be read with interest.

Relying on the large number of published reports, it appeared to Nocard: 1. That, in tuberculous adult animals, one injection of a large dose of tuberculin —25 to 50 centigrammes, according to the weight of the animal—caused, in between the tenth and eighteenth hour, an elevation of from 1° to 3° (Centigrade); 2. That, in *healthy adults*, the same injection produces a very slight rise—some tenths of a degree—or no effect at all; 3. That, in phthisical cattle—those in the last stage of tuberculosis—the reaction consecutive to injection of tuberculin may not occur.

Nocard experimented on 57 animals of the bovine species destined for slaughter, and made an autopsy on them when they were killd." In this list,

7 calves and queys are not included—in these young animals the reaction after injection was very variable, and appeared to be independent of the existence or absence of tuberculosis.

Of these 57 animals, 19 showed in from ten to twenty hours—after one injection of 20 to 40 centigrammes of tuberculin—an elevation of from 1·4° to 2·9° *central* temperature; one only showed ·8° rise.

Of these 19 animals, the autopsy proved that 17 were tuberculous in various degrees, 2 were not tuberculous, 1 had cirrhosis of the liver with the biliary canals, gorged with distomes—this is the one that had its temperature rise only ·8°; the other was a quey fifteen months old, affected with adenitis, all the lymphatic glands accessible to exploration being considerably hypertrophied, but there was no appreciable *leucocytosis*; inoculation and bacteriological examination of an extirpated gland, proved that the lesion was not tuberculous—though the injection of tuberculin caused a rise of more than 2° in this animal, and the reaction, which was manifested in ten hours after the injection, persisted to the same degree for sixty hours, not assuming its normal standard until the fifth day. The same intense and prolonged reaction occurred every time the injection was repeated, which was three times, at twenty days, interval, and—which is very curious—on each occasion the glandular affection seemed to acquire renewed development. The autopsy revealed lymphadenomes of all dimensions disseminated everywhere, but not a trace of tuberculosis.

Of the 38 animals which did not manifest any thermic reaction, two were tuberculous, being *phthisical* to the last degree, with generalised lesions in all the organs. In one of them, injection of tuberculin had even produced a fall of ·3° in 38 hours.

Among the 17 animals that the tuberculin had revealed to be tuberculous, and which an autopsy demonstrated to be so, eight were in good condition—so much so, that it would have been impossible to suspect them of being diseased while alive, but for this test.

Among the 38 cattle which did not manifest any reaction, were two very fat bullocks, 11 bullocks and cows of first quality, 9 of second quality, and 15 of third quality. They were not all healthy, for 2 had acute pleuro-pneumonia, 2 chronic pleuro-pneumonia with *sequestra*, 1 verminous bronchitis, 3 echinococci of the lung, and 1 actinomycosis of the jaw.

These experiments also allowed a comparative trial to be made with tuberculin, prepared by Roux of the Pasteur Institute. Among the specimens tried, there were some which were equal, if not superior, to that of Koch's lymph.

Nocard is of opinion that we have, in injections of tuberculin, a precious means of arriving at a correct diagnosis—otherwise something so difficult—of bovine tuberculosis. Considering the danger incurred by consumers of the milk of cows—and especially by children, Nocard strongly insists on submitting dairy cattle to this criterium; but of course this procedure should be added to the other means of diagnosis, though it has the advantage of being serviceable when there is neither nasal discharge, expectoration, suppuration, or any other product which might be employed for inoculation or bacteriological examination.

In concluding his paper, Nocard impressed upon the Academy the necessity of representing to the Agricultural Administration to consider the question of Sanitary inspection of the cow-sheds which furnish the public with milk.

It will be remembered that, soon after publicity had been given to Koch's discovery of tuberculin, the Royal College of Veterinary Surgeons took steps to have it experimented with, in order to test its value in bovine tuberculosis. A supply of tuberculin having been procured, this was distributed to the three Veterinary Schools in Scotland, the Principals of which undertook to conduct the required experiments. Their reports were recently presented, and from

these it appears, that at the Dick Veterinary College, four bovines were experimented upon. One of these, although extensively affected with pulmonary tuberculosis, gave no indications of reaction after inoculation and re-inoculation; another, which was not tuberculous, showed marked reaction a few hours after the first inoculation, and again during the night of the second day, but no reaction was noted after the second inoculation; a third, which also was free from tuberculosis, showed no reaction after inoculation or re-inoculation, but the temperature fell abnormally on the night of the second day, after the first inoculation; while the fourth cow, which was tuberculous, gave decided evidence of reaction after the first and second inoculations.

At the Edinburgh New Veterinary College, the experiments were made on several pigs and a cow, and the results, as given by Professor Williams, were to the effect that "tuberculin is of value in determining whether or not an animal is affected with tuberculosis, and, should need be, I would be inclined to use it as an aid to the diagnosis of tuberculosis." It will be noted this is an analogous conclusion to that arrived at by Nocard.

At the Glasgow Veterinary College, a number of cows were inoculated, and Principal McCall says: "Reviewing these experiments, I think we are forced to the conclusion that tuberculin, in the circumstances mentioned, and in the doses administered, proved itself of no reliable value in diagnosing the existence of tuberculosis in the animals operated on."

From all the reports which we have examined, it is difficult to arrive at a satisfactory conclusion with regard to tuberculin, but perhaps the balance of evidence is in favour of Nocard's opinion.

THE INCUBATION OF HYDROPHOBIA.

Some persons are incredulous as to cases of hydrophobia occurring after a long period of incubation, but the following well-authenticated instance—the most recent of its kind—appears in the *Œsterr. Monatsschr. u. Revue für Theirheilkunde* (No. 7). A child, 5½ years old, was bitten by a dog on the right leg on August 25th, 1888. The animal died two days afterwards, having also wounded its master and some other persons. The child's wound was dressed by a surgeon, who washed it out with a solution of corrosive sublimate, as well as injected a stronger solution beneath the injury. Towards the end of December, 1890—or two years and four months after the bite—the child was seized with hydrophobia and died. Three rabbits were inoculated with portions of its brain and spinal cord, and in 38 days these manifested the typical symptoms of rabific paraplegia, and died within 20 days after inoculation; so that there could be no doubt as to the diagnosis of the disease that killed the child.

SOUTH AFRICAN HORSE SICKNESS.

M. Pasteur has, it appears, been interviewed by a representative of the *Daily Graphic*, on the subject of the deadly equine disease that exists over a large portion of the African Continent, rendering it uninhabitable for horses and mules, and which has been so often alluded to in the pages of the *Veterinary Journal* ever since its commencement. Much has been made of Pasteur's remarks on this malady, but it is evident that he does not know what has been already done by English Veterinary Surgeons in this direction, and his interviewer seems to have been no better informed.

The mention of Horsley as a person who could undertake the investigation of such an obscure disease as this, shows how little Pasteur knows of the position or capabilities of English Surgeons. However, as his views have

acquired a large amount of publicity—though there is absolutely nothing novel in them—they are given here in the following interview.

The interviewer said: "It is a question of great moment to Englishmen. It is being widely discussed. Lord Randolph Churchill has been drawing attention to the terrible illness which befalls horses and mules in South Africa."

"I have heard of the illness," said M. Pasteur. "And then?"

"A discussion has arisen as to the best means to combat this malady, which threatens to render the exploitation of this wonderful country impossible. Some think that the disease is caused by a microbe, in which case inoculation of some kind would be—according to the theory of M. Pasteur—the remedy. Would you give an opinion?"

"It is impossible for me to do so, seeing that I have not studied the disease. I cannot express thus at a moment's notice an opinion which could only be formed by years of careful study and scientific research. I am not competent."

"But you know of the disease. It is very terrible. Lord Randolph Churchill says that it is responsible for the death of from 90 to 95 per cent. of the horses and mules brought into the country. That means that transit is almost impossible, and that agriculture is out of the question."

"Is it as bad as that? Tell me; I am very ignorant about this malady. Does Lord Churchill give the symptoms? Can you describe the malady?"

I took a copy of Lord Randolph's letter, and read the passage commencing, "The animal appeared to have been seized with pleurisy, producing a thick discharge," &c. As I read, M. Pasteur nodded his head.

"A profuse discharge. A yellow serum. The spasms consequent on suffocation. *C'est bien cela.* I should say that most decidedly this malady is caused by a certain kind of microbe. It appears to me to be a form of the disease known as 'charbon.' Not the same disease certainly, but something akin. The symptoms decidedly point to a microbian infection. But I can't say. I haven't studied it. To speak definitely I should want to study it at length. One ought to see a sample of the blood of one of the animals brought over in a pure state. It is evidently a disease caused by certain local conditions. These one would have to study. Certainly I think that those correspondents are right who say that inoculation would be the remedy; but what is one to inoculate? One must find the microbe of the disease first. Has that been done? It is not to be contested that almost all the terrible maladies which destroy animal life, as the charbon among sheep and cattle, the rouget, or red fever, among swine, and hydrophobia among dogs are microbian, and can be combated by inoculation of an attenuated form of the disease, obtained in the manner now known to the public. That is established, is it not? Thus, for charbon, which formerly used to create such ravages among the cattle in Australia, inoculation is now generally practised, and very excellent results are obtained. Doubtless the same excellent results would be obtained by a similar process in this disease also. For, as I say, from the symptoms you describe, and from what I know of the disease myself, which is very little, a microbe is at the bottom of the trouble. I do not say that it is the same disease as the charbon, but it looks very nearly akin to it."

"It has been noticed," I said, quoting Mr. Duck's letter, "that the animals are always attacked after grazing on the grass of the veld, and from this it has been conjectured that there is something in the food, that is to say, in the veld pasture, which communicates the disease."

"That is exactly what is the case in the charbon plague. Animals die and are buried, and the microbes come up from their pestilential decaying bodies to the surface, carried up by the earth-worms, or in other ways that we cannot ascertain, and are conveyed into the systems of the animals which

graze the grass above the graves of the dead beasts by the stomach. Is it not likely that something of the same kind may be the case here? Must not the veld-grass cover a perfect cemetery of decayed bodies, hives of pestilential carbonaceous microbes? Doubtless the microbes of the South African veld are different from those which cause the charbon disease, the *media* in which they are engendered being different organisms from those which engender the microbes in the Australian pasture lands, for instance, and possibly that may account for the difference of the malady from charbon proper. But, as I have said, it is very difficult indeed to speak without study. It is evident that inoculation is the cure. What the inoculation is to be, it should be the duty of the British Government to discover. Let some of your savants be put to work to study it. Let men—for you have most capable men in England—be sent out to examine the disease on the spot. There is a cure to be found; for all microbian diseases there is a cure. It is a question of study and patience. You have great men in England—Horsley, for instance, and others. And you have excellent veterinary surgeons. I know that. I see many Englishmen at work at the Institute here. You have the men for the work. Let the Government, if it is interested in this country, and wishes to remove the impediment to its prosperity, entrust this duty to some of these men. It should be worth their while, no matter what the cost may be. All diseases of this kind can be extirpated by inoculation of an attenuated form of the malady. By inoculating all the dogs in Christendom with the rabies vaccine we could stop hydrophobia the world over, and might close up our institute. But, of course, it would be impossible to do that, seeing the immensity of the task. One would want miles and miles of kennels. The thing would be totally impracticable. But with the horses and mules—especially considering the amounts of money value at stake—it would not only be practical, but seems imperative."

MILITARY VETERINARIANS.

THE condition of the Military Veterinary Surgeon, says the *Lancet*, in an annotation, appears to be a somewhat anomalous one, not only in our own, but also in Continental armies. The Germany Military Authorities seem to have been made aware, by a partial boycotting of the Veterinary Department, of the unsatisfactory status enjoyed by most of its members. Candidates have to show that they have obtained the maturity or leaving certificate from the highest class of a *Gymnasium* or of a *Realschule*—that is to say, they must have passed an examination equivalent to the intermediate B.A. or B.Sc. of the London University, and then they have to go through the course at the Veterinary College. Notwithstanding this, they only enter the Army in the position of non-commissioned officers, with pay amounting to £90 a year, and it is not until they reach the higher ranks that they obtain the status of commissioned officers. Some improvement is, it seems, about to be made by the raising of a large number of the junior members of the Department to a higher rank.

We do not share in the opinion of our esteemed contemporary, that there is anything anomalous in the position of Veterinary Surgeons in the English army, as they are now fairly treated; but our colleagues in the German army have been most disgracefully dealt with, owing, we suppose, to the "Junker" or aristocratic influence which is so rampant among the combatant officers in that army. Though a much higher standard of general and professional knowledge is required of them than of those in our army, yet they occupy a far inferior position, and yet it is superior to that held by Veterinary Surgeons in the United States army, which is a disgrace to the Government of that country.

ROYAL VETERINARY COLLEGE.

At a meeting of the Governors of this college, held on 18th December, a recommendation from the General Purposes Committee was submitted and unanimously approved, appointing Prof. McFadyean, F.R.S.E., M.B., B.Sc., C.M., M.R.C.V.S., Dean of the College, and Professor of Pathology and Bacteriology; Prof. Macqueen, F.R.C.V.S., was also appointed to the professorship of cattle pathology.

On behalf of the Governors, Sir Nigel Kingscote thanked Prof. Brown for the assistance he had given them as Principal of the College, and hoped he would retain that office, and also, at the next opportunity, be elected a member of the governing body.

It was announced in connection with the recent celebration of the centenary, that Her Majesty the Queen had graciously consented to be Patron of the College, and had also become an annual subscriber to the funds of the Institution.

Proceedings of the Royal College of Veterinary Surgeons and Veterinary Medical Societies, etc.

ROYAL COLLEGE OF VETERINARY SURGEONS.

Meeting of Council, Held December 11th, 1891.

The President, Veterinary-Colonel Lambert, C.B., in the chair.

Present—Dr. Fleming, C.B.; Sir Henry Simpson; Messrs. Burnett, Edgar, Fraser, Hunting, Mason, Mulvey; Veterinary Captain Raymond; Messrs. Jas. Simpson, Trigger, Wheatley, Wragg, Thatcher (Solicitor), and the Secretary.

The Secretary read the notice convening the meeting.

The Secretary announced that letters had been received from Messrs. Walley, Taylor, McCall, Nisbet, Greaves, and Malcolm, expressing their regret at their inability to attend the meeting.

Professor McCall had written the following letter:

"My Dear President,—When the terms of the proposed new Charter were under discussion it was unanimously carried that the annual meeting might be held with advantage in any city where a veterinary college existed. At present the annual meeting can only be held in London, Edinburgh, and Dublin, and I observe that under the new Charter the conditions are the same. I pointed this out to Mr. Hill, and desired him to see that the alteration was made according to the agreement, and he led me to think that I was correct as to the understanding and voice of the meeting; but at the last moment I find the alteration has not been made, and I now apply to you as President, to see that the alteration is made. It is not a matter of vital interest, but at the same time it is but right that the Council should have the power to hold their meetings in any city where they think it would be to the advantage of the profession to hold them. It was my earnest wish to have had the annual meeting at Glasgow during my term of office as President, but we had not the power, nor would the Council have that power in the future unless the alteration is now made. I regret much that I cannot be at your meeting, and will take it as a favour if you read this letter and make my apology.—Yours truly, James McCall."

The President said the matter would be dealt with after a little time.

Mr. Burnett moved—"That a clause be inserted into the new Charter that the country be divided into electoral constituencies." He said that at the present time Scotland had four representatives on the Council, three of them being Principals of the colleges. He did not mean to imply that the Principals had not done their duty, because he was sure they had; but it was very difficult to get anyone outside the colleges elected on the Council. The maxi-

mum number that Scotland had ever been represented by was four, but oftener it was two or three. Ireland at the present time had not a single representative on the Council, and the same was true of Wales. The Principals of the colleges could well afford to remain inactive on this subject, but they had not always done so. They were sure to be returned by the graduates who had passed through their hands. They therefore need not be afraid, although the country were divided into electoral constituencies, because their services would certainly be sought after. But it was difficult for anyone outside the colleges to gain a seat on the Council. At the last election the country saw the need of reform, and England came to the front and sent a number of reformers; but when the reforms that England desired had passed, things would return to the same state as before.

Sir HENRY SIMPSON: Each college would have one seat taken for granted, so that the Principal would come here whether elected or not. Is his to be a seat without election?

Mr. BURNETT: Yes, I do not go in for that mode of election. I am only showing what was done at the meeting.

Sir HENRY SIMPSON: I am only asking for information.

Mr. JAMES SIMPSON: How many from India?

Mr. HUNTING. Scotland seven? that is about double what it ought to have numerically.

Sir HENRY SIMPSON: Do you propose to divide England into territories too? How many territories would you have in Scotland?

Mr. BURNETT: Seven representatives we would group in seven districts.

Sir HENRY SIMPSON: That is to say, for all England you would have territorial districts with one representative?

Mr. BURNETT: Yes.

Sir HENRY SIMPSON: With regard to the Liverpool and Manchester district, would you make any allowance? Would you give Manchester the same representation territorially as Cornwall and Wales?

Mr. BURNETT: But Wales has two only.

Sir HENRY SIMPSON: Confine yourself to Cornwall only. As I understand it, Manchester and Liverpool would be in one division, and the whole of the division would have one representative; whereas Cornwall, for example, would have one also; so that the whole of the veterinary surgeons of Manchester and Liverpool would have no more than the few in Cornwall.

Mr. BURNETT: Yes.

Sir HENRY SIMPSON: That is territorial representation?

Mr. BURNETT: Yes.

Sir HENRY SIMPSON: And that is what you mean?

Mr. BURNETT: Yes. Of course it requires some time to work it out in detail.

Sir HENRY SIMPSON: But you are here to initiate, and it is assumed you have worked it out. I am not opposing it. I only want to know.

Mr. BURNETT: I have only worked it out for Scotland.

The PRESIDENT: Then will you move the resolution you wish to put?

Mr. BURNETT: Yes. "That a clause be inserted into the New Charter that the country be divided into electoral constituencies."

The PRESIDENT: You do not say "territorial."

Mr. BURNETT: No; I like "electoral."

The PRESIDENT: Does any gentleman second the proposition of Mr. Burnett? (After a pause.) It is not seconded.

Mr. MULVEY: I beg to move—"That the seal of the College be affixed to the petition for the Supplemental Charter."

Mr. J. SIMPSON seconded that.

The PRESIDENT: Before the seal is affixed has any gentleman any motion to bring forward on Professor McCall's proposition?

Dr. FLEMING: Is it a fact that he states that Glasgow was included in the places?

Mr. THATCHER (the Solicitor): I did not understand it so, but he has mistaken what passed at the Committee with what passed at the Council meeting. There was some proposition as to both places and times at the Committee, but the Council did not adopt it.

Mr. J. SIMPSON: I understand we have the power by this new Charter to go where we like. Is that so?

Mr. MULVEY: No.

The PRESIDENT: No.

Mr. MULVEY: We are here for a specific purpose. I do not think this matter should be reopened again. The thing has been discussed over and over again. We are here for a specific purpose—to affix the seal to this petition.

The PRESIDENT: I am advised by the Solicitor that we should not go into this matter now; that we are here for the purpose of affixing the seal.

Sir HENRY SIMPSON: I should like to say a few words. I am not going to move an amendment, but I cannot let this opportunity go by without stating, and stating deliberately, what I think of some of the reasons in this Prayer to the Queen.

Mr. MULVEY: I really must rise to a point of order. There has been plenty of time to discuss this. Meetings have been held over and over again, and we are called together to-day for a specific purpose, and I say we cannot now discuss these clauses.

The PRESIDENT: Mr. Thatcher advises that we should hear Sir Henry Simpson.

Sir HENRY SIMPSON: Do I understand that if I choose to move an amendment I am not at liberty to do so?

The PRESIDENT: Do you wish to move an amendment?

Sir HENRY SIMPSON: No, but I do object to being dragged here for a mechanical purpose.

The PRESIDENT: It is settled that you go on.

Sir HENRY SIMPSON: Very well, Mr. President, I am unfortunately troubled with rather a long memory, but with regard to the power which is sought to be taken away from a certain section of the profession by this memorial, I cannot help calling your attention.

Captain RAYMOND: May I rise to a question of order? I think we are now on the first paragraph, to affix the seal to the petition for the Supplementary Charter.

The PRESIDENT: I will just tell you what Mr. Thatcher says.

Sir HENRY SIMPSON: Will you allow me to state, in the face of an organised opposition, that I do not intend to say anything?]

The PRESIDENT: Mr. Thatcher says, in the face of such a resolution as this is, you have a perfect right to move an amendment.

Dr. FLEMING: This is the first time I have seen the petition, and if it is to be passed without discussion—well——

Mr. JAMES SIMPSON: May I also suggest that it is calling a body of gentlemen together for a mere form.

The PRESIDENT: The ruling of the chair is on the advice of the Solicitor, that any gentleman now is at liberty to move an amendment. Sir Henry Simpson, you can move an amendment.

Sir HENRY SIMPSON: I thank you very much for your sympathetic way of meeting me; but I see from one end of the table to the other there is going to be an opposition, and I decline. This has not been in my possession twenty-four hours, and I am supposed to swallow the whole thing simply to make a quorum—simply that these gentlemen may have their own sweet wills.

The PRESIDENT: But I invited discussion.

Sir HENRY SIMPSON: But in the face of two gentlemen rising to oppose me. I have been a member of the Council for fifteen years, and never received such treatment as to-day, except on one occasion, when I was insulted. I won't say anything.

Dr. FLEMING: May I put one important question? Might I enquire if the whole of the Fellows of the Royal College of Veterinary Surgeons have been asked whether they are willing to forego their privileges as defined in this Charter?

Captain RAYMOND: The first paragraph in the notice calling the meeting is, "To affix the seal to the petition for the Supplemental Charter." Then the second paragraph says, "To approve of the form of the draft." Well, we must first of all, I submit, affix a seal to the petition; and then on the second subject, if any gentleman likes to oppose it he can.

The PRESIDENT: You cannot affix the seal until it is moved and seconded, and then if any gentleman likes to move an amendment he can. That is the law. Mr. Thatcher will reply to Dr. Fleming's question.

Mr. THATCHER (Solicitor.)—I do not quite understand what your question was, Dr. Fleming—whether the Fellows have been specifically communicated with on the subjects? No further than anyone else. They are represented here as well as the ordinary members of the College.

Dr. FLEMING: I said the whole body of the Fellows. A large number are not here.

Mr. THATCHER: They are represented.

Dr. FLEMING: But the whole body of the members is represented here. I think I might explain the origin of my question. We are everyone aware that certain privileges were held out to members to become Fellows. For those privileges they studied, passed an examination, and paid money. It is now sought to deprive them of those privileges without consulting them. I think the opinion of those Fellows should be obtained, because there are a great many Fellows not here.

Mr. THATCHER: This will not pass through the Privy Council without full notice to everybody. Immediately the petition is presented notices will be inserted in the *Gazette*, giving the specific time in which any objection or counter-petition can be lodged. The Fellows will thus have full power to object to the Charter being passed. They can present a counter-petition, or have it modified in any way they desire, and the thing will be fully considered, and, if necessary, fully discussed, before the Charter is allowed to pass.

Mr. JAMES SIMPSON: The Council will probably remember that I proposed some time ago that a copy of this Charter should be forwarded to every member of the profession, and that was carried.

Mr. HUNTING: I should like to ask another question of the Solicitor, whether he is aware of any difference in the treatment of this Charter and the three previous Charters, and whether in the case of the three previous Charters, every member of the profession was consulted concerning them.

Mr. THATCHER: I can only speak of one Charter, 1882, and so far as I know, it was then left to the Council.

Mr. HUNTING: The same as all the others.

The PRESIDENT: My aim has been to sail on an even keel, and upon every opportunity to consult Mr. Thatcher before any step was taken. I said to him, "Now with regard to presenting the petition, supposing there is any objection on the part of any section of the Fellows, can those gentlemen then make their protest with as full power as at any previous stage?" He said, "Certainly; anyone objecting can lay his protest before the Privy Council, or a counter-petition, and it will be fully investigated." It struck me that that gave every opportunity of fairness.

Dr. FLEMING: With regard to paragraph 6, "That the election of men to a

paid office by a body on which they sit and may vote is obviously objectionable, although no imputation is alleged against any individual who, being a member of Council, has also acted as examiner." I think that is not very favorable for our College. It is casting a reflection on the profession.

Mr. THATCHER: It was a special resolution passed at the last Council meeting. It was specially moved and passed.

Dr. FLEMING: I am rather ashamed of it. It is not very creditable to us as a professional body.

The motion was then put and carried, eleven voting for it, and none against it.

Mr. JAMES SIMPSON: I beg to propose that this Council do approve of the draft Supplemental Charter.

Mr. TRIGGER: I beg to second that.

The motion was carried *nem. con.*

Sir HENRY SIMPSON: May I ask as a matter of order, on another occasion would it be advisable to settle the draft before signing the petition? There are certain things put in the petition, but suppose we had altered the draft? I am not referring to this matter, because it is over; but it occurred to me we should have discussed the draft and settled it, and then have put the seal to the petition.

Mr. THATCHER: But you did settle it at the last meeting, subject to one thing—that it was to be submitted to counsel to make any necessary amendments. I have his opinion here, and shall be very happy to submit it to you after the meeting, and you will be surprised at the very few amendments he has made; in fact, the draft of the petition, as it is now, is to all intents and purposes as signed by Council.

Sir HENRY SIMPSON: I am only a layman, but I should have thought, if you were going to send in a petition for a Supplemental Charter, the first thing would have been to settle what was to be in the Supplemental Charter. Of course you have now settled the Supplemental Charter without debate.

The PRESIDENT: Oh, no. That has been very fully debated.

Mr. THATCHER: The draft of the Charter is an echo—almost a copy—of the prayer of the petition. We have kept our prayer within the four corners of what was passed at the last Council meeting.

Sir HENRY SIMPSON: Very well.

Mr. JAMES SIMPSON: Now may I ask how soon this draft and prayer will be sent to the members of the profession?

Mr. THATCHER: It is all in type. It only wants striking off to be sent out.

The SECRETARY: They will give an undertaking to get it out within a fortnight of any time.

The PRESIDENT: Then it will be within a fortnight.

The SOLICITOR reported that the magistrate at West London Police Court dismissed the summons against Mr. Robinson, an unqualified person, for displaying the word veterinary in connection with a forge, and that he (the Solicitor) was taking the necessary steps to obtain the opinion of the superior Court, which was approved.

A vote of thanks was given to the President, and the proceedings terminated.

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

A MEETING of the Association was held on November 13th, at the White Hart Hotel, Burton-on-Trent, Mr. J. Malcolm, of Birmingham (President) being in the chair. There were also present Messrs. Smith, Tunstall; T. H. Merrick, Northampton; Parker, Stanley, Birmingham; Stanley, Carless, Worcester;

Carless, Stafford; Greaves, Manchester; Hodgkinson, Uttoxeter; Russell, Grantham; Wartnaby, Burton; Barrett, Nuneaton; Dawes, West Bromwich; Birchnall, Loughboro'; Gold, Redditch; Olver, Tamworth; Trigger, Newcastle; Crowhurst, Leamington; Bainbridge, Wellingboro'.

Visitors, Messrs. G. H. Hodgkinson, A. Williams, G. Atkinson, Dr. Hooper, and G. W. Lees.

The Hon. Secretary read letters of apology from Professors Williams, Walley, McFadyean, Penberthy, Axe, Messrs. Hunting, Beddard, Blakeway, etc.

After the minutes of the last meeting had been read and confirmed, the Chairman said the next business he had to bring before them was of a particularly sad and mournful nature. It referred to the death of their esteemed friend and colleague Mr. Blakeway, of Stourbridge. On similar occasions it had been the custom of the society to send a letter of condolence and sympathy to the friends of the deceased, and he felt sure it was the wish of one and all of them that the custom should be adhered to on this occasion. (Hear, hear.) Mr. Blakeway could not be regarded as an ordinary member of the society; he had been connected with it a greater number of years than any one of them, and had filled all its more important offices. For the last fifteen years he had been treasurer, and he occupied that position in a manner such as he alone could fill it. His kind, courteous, and considerate manner endeared him to them all, while his remarkable ability, and sterling rectitude, marked him out as a model treasurer. The enthusiastic unanimity with which from year to year they re-elected him spoke far more eloquently than he (the President) could of the appreciation in which they held his services. It was no wonder that his reputation should have been more than a local one. In 1876 the Royal College of Veterinary Surgeons honoured him by making him one of the foundation Fellows. In the same year the Midland Counties Veterinary Medical Association secured his election to the Council Board, where he sat continuously until 1885, and this year he was elected Vice-president, but the illness which proved fatal occurred, and he was unable to take part in the active proceedings. In recognition of the long-continued and disinterested services Mr. Blakeway had given to the society, he moved a vote of condolence with the family, accompanied with an expression of the great loss the association had sustained by his death.

Mr. GREAVES, Manchester, seconded, and echoed every word the President had spoken. He had been acquainted with Mr. Blakeway for many years—even from the commencement of the association. He had met him in times when they were not prospering, and had come in contact with him when their outlook was bright, and on all occasions he found him an earnest, zealous man, and one who had the welfare of his profession at heart, and the good of this association in particular.

Mr. H. OLVER, Tamworth, said that twenty years ago, when the society was likely to collapse Mr. Blakeway came to their assistance, and, but for the able manner in which he conducted the business at that time the association would not have existed.

Captain RUSSELL, Grantham, also spoke in support, and suggested that the expression of their feelings should be engrossed on vellum and forwarded to the widow.

Mr. TRIGGER, Newcastle, said the society had lost what they almost might regard as its head, because Mr. Blakeway had for years been recognised as a leading spirit of the association, and it was almost entirely due to his efforts, seconded undoubtedly by some very good men—notably Mr. Olver—that the association was extricated from poverty and placed in the present position of affluence. Few associations worked more amicably than this, and seldom it was that its members struck a discordant note, but all that was owing to such

men as Mr. Blakeway. Thanks to men of his stamp, the society was doing a great and good work, and while Mr. Blakeway had been removed from their midst, his works, he was happy to think, were left behind for their profit.

The resolution, with Capt. Russell's suggestion embodied therein, was carried unanimously.

Mr. WRIGHT of Kidderminster, was nominated for membership.

Mr. M. SADLER, Burton; was elected a member.

Mr. OLVER then read the report of the committee on the Black-leg experiments:

Your Committee herewith hand you a report of their procedure in connection with the authorised experiments on calves, etc., for the purpose of testing the efficacy of setoning and the so-called protective inoculation for the prevention of black-leg.

These experiments, you will remember, were initiated in consequence of the publication, by Professor McFadyean, of the results said to be obtained on the Continent, which credited protective inoculation with ensuring an almost complete immunity from this fatal disease.

The members of the Society who agreed to act on the Committee were Professor Penberthy, Captain Russell, Messrs. Blakeway and Olver, with the President and Secretary as *ex-officio* members. Unfortunately, through unforeseen circumstances, neither Professor Penberthy nor Captain Russell have been able to take any part in the proceedings.

As the proposed experiments came under the Vivisection Act, vivisection licenses had to be obtained. After these had been duly granted, the Committee arranged with Mr. Slater, Brook Farm, Tamworth, to provide the requisite animals for our purpose.

It was arranged that the first meeting should take place at the Brook Farm on Monday, March 2, Professor McFadyean having, on the previous Saturday, transmitted to us quantities of protective vaccine as prepared both by the Lyons and Kitt's method.

At this meeting four calves and two sheep were inoculated with the Lyons vaccine, and two calves and two sheep with Kitt's vaccine; three calves were setoned, each being done according to the formulæ of different practitioners, and two calves and two sheep were kept as control animals.

The inoculation in these and in the subsequent cases were all conducted under antiseptic precautions.

On Tuesday, March 17th, a second meeting was held, when the whole of these animals (eleven cattle and six sheep) were inoculated with virulent muscle powder of black-leg. On the 19th ult. the six sheep—*i.e.*, both the inoculated and the control animals—died from what appeared to be general black-leg.

On the other hand none of the calves exhibited any material alteration from the normal, neither the appetite, pulse, respiration, nor temperature being appreciably interfered with. Locally, all the calves had a well-marked swelling round the seat of inoculation, and the swelling was decidedly more extensive on the control than on the other calves; but no differentiation could be made between the swellings of the inoculated and the setoned animals. The dose employed in each case was quite sufficient, according to Continental authorities, to kill any two calves. The same dose was used for the sheep as the calves.

Owing to various reasons, further experiments were delayed until the 26th August, on which date one calf, setoned a fortnight previously, one control calf, one guinea-pig, and one of the calves inoculated on the 17th March, were inoculated with half-an-ounce of the expressed muscle juice from the affected muscle of a calf which died from black-leg on the previous day.

The guinea-pig died twenty-four hours after inoculation, but none of the

calves exhibited any material disturbance. The next experiments were made on the 22nd September, when the setoned calf that was inoculated on the 26th August, and one control calf, were inoculated with one ounce of the expressed muscle juice from the affected muscle of a calf newly dead from black-leg on the farm on which these experiments were being conducted. Neither of these calves were appreciably affected by the inoculation.

The results of the experiments have, to say the least, been staggering; for, while we find the sheep and guinea-pigs readily succumbing to inoculation with virulent material, the calves, on the other hand, whether inoculated, setoned, or control animals, have all successfully withstood its influence. This would appear to indicate that sheep are actually more susceptible to black-leg than calves if the virus be directly introduced to the system: it likewise points to the possibility of many calves being classed as protected by inoculation, when in reality they may have possessed some inherent immunity from the disease.

It would also seem that the risk of contagion from black-leg, at least so far as calves are concerned, cannot be very great.

Finally they clearly show that the prevention of black-leg by protective inoculation is still, so far as this country is concerned, by no means established.

We regret the results we furnish you are not more definite; at the same time we think they must be beneficial if they only convince you of the undoubted necessity for further investigation.

After one or two questions had been asked and answered,

Mr. TRIGGER moved that a vote of thanks be given to the members of the committee, and that it be recorded on the minutes.

This was seconded by Mr. MERRICK, Northampton; and unanimously agreed to.

"HOOSE, OR HUSK, IN CALVES,"

By G. Wartnaby, M.R.C.V.S., Burton-on-Trent.

Mr. PRESIDENT and GENTLEMEN, I appear before you to-day in a character quite new to me, and, much as I appreciate the high compliment paid me, I must candidly confess that I would have much preferred that some more able member should have occupied my place on this occasion.

I will take this opportunity of expressing the very great pleasure I have in welcoming such a representative gathering of our profession in my own town. It is, I believe, the first visit of the Midland Counties' Veterinary Medical Society to Burton-on-Trent, and I trust that, far from being the last, in future Burton may be a chosen place of meeting with other towns.

The subject I have selected for a short paper this morning is "Hoose or Husk in Calves," a disease from which hundreds of young stock are lost annually in this country, causing a waste of food product which is to be deplored as a national loss. I have not chosen this particular subject with the idea that I can myself throw much new light upon it, but more in the hope of raising a discussion, the result of which may be, not only interesting to ourselves, but of some future benefit to stock-owners, who form so large and important a class in this country.

I think you will agree with me that the lack of definite information as to the life-history of the parasite which is the cause of hoose, must prevent any really scientific remedy, and that is why I am anxious to-day to draw your attention not so much to hoose itself as to the parasite, and the preventive measures. I propose, therefore, to give in as few words as possible an outline of the disease, its symptoms and treatment, followed by a consideration of the strongyle and possible measures for its extermination.

Hoose is a parasitic disease prevailing amongst cattle, pastured on low-

lying lands. It commences as early as July, and is seen as late even as October. In some districts it makes its appearance annually, while in others it seems to be quite unknown. It is caused by a nematode, presenting a thread-like appearance, known as the strongylus micrurus, the male specimen of which measures about one and a half inches, and the female three inches in length. It is one of the armed strongyli, has a filliform body, and mouth with three papillæ; it is found in the trachea and bronchial tubes of cattle of all ages; though calves under twelve months old are alone seriously affected by it, and with them the mortality is at times very great,

I have seen these strongyli matted together in such a mass as to present the appearance of a ball of cotton, and completely blocking the trachea. It is a debatable point how they find their way into the air-passages and lungs. Some maintain they are taken with the food into the mouth, and make their way direct, either prior to or during the act of rumination. Others hold that having been taken into the digestive tract with the food they are then conveyed by means of the circulation to the air-passages. With the latter opinion I agree—as we know that many parasites which infect mammalia, do find their way to the different organs of the body in this manner. Professor Williams says he has seen this strongyle in the blood-vessels, which to my mind is conclusive. In *post-mortems* I have made on animals that have died of hoose, I have noticed that the parasites found in the small bronchial tubes are generally less, and therefore, I suppose, younger than those found in the trachea, which leads me to think it is in the small bronchial tubes they are first deposited, and as they grow they work their way into the larger air-passages.

The symptoms of hoose are briefly, a husky cough—at first the only indication of the disease, the animal not being affected in appetite, appearance, or condition. This cough, if not relieved, is followed by accelerated breathing, often accompanied with a grunt, indigestion, loss of appetite, emaciation, tympany, pneumonia, and in many cases death from suffocation. Hoose is rarely detected by the farmer himself in the earliest stage, and when it is the discovery is generally aecidental. He has occasion to move his stock from one pasture to another, and, in so doing, hears for the first time the characteristic cough which is induced by the act of driving. Now, this is the time when treatment would be most effectual; but, strange to say, farmers, although suffering grave losses year after year, for the most part regard its commencement with apathy, and do not seek for skilled assistance until the disease obtains such a hold, and such an amount of constitutional disturbance is set up, as to render treatment, in the worst cases, unavailing.

Hoose has been mistaken for pleuro-pneumonia, from which, however, it differs in many ways, the most marked of which is that in hoose, nearly the whole herd is affected together, whereas in pleuro-pneumonia, not more than one or two are usually attacked at the same time; an interval of some days or even weeks elapsing before other cases follow.

With regard to treatment, I think it desirable to have the weakest calves housed day and night, feeding them on milk or porridge, in other words, return to the diet they lost too early in spring.

I find fumigation, intra-tracheal injection, and drenching, all successful forms of treatment. To guard against possible suffocation in fumigation with chlorine or sulphurous acid gas, my plan is to remain in the building with the animals, and when no longer able to do so, discontinue the supply of gas, allowing the animals to remain in the fumes for twenty minutes or half-an-hour. Of course care must be taken to choose a suitable building for the purpose, so that the gas does not escape too rapidly by the roof or other opening.

As an intra-tracheal injection, I believe some prefer bichlor. mercury to

turpentine and creosote; I use the latter, being careful that the point of the syringe has duly entered the trachea, for it is extremely easy to let the needle slip on one side, even when great care is taken. The animal's breath will, if the operation is successfully accomplished, smell strongly of the agent, I mean, of course, when creosote is used; it is also necessary to empty the syringe slowly, or there is great risk of killing the patient; I have heard of heavy losses from both the foregoing remedies being imperfectly carried out. So far as my personal experience goes, I have found drenching with oil of turpentine, iron and compound tincture of camphor, the most successful mode of treatment, if the animals are *previously fasted.* On this point I lay great stress, as in my opinion the drench is almost useless unless given in that way.

Turning to the parasite, it has often occurred to me, how probable it is for this *strongylus micrurus* to have a similar life history to that of the *fasciola hepatica*, which is the cause of rot in sheep, and I will, if you will allow me, here digress while I draw your attention to the history of this fluke, as by so doing I can, I think, make my reasons for so thinking, plainer to you. The "liver fluke," as we know, deposits its eggs in the gall duct of the sheep, from here they are carried with the bile into intestines and pass out with the fæces on to the pasture where they are hatched, the time of hatching varying considerably, but is generally about three weeks, when the embryo escapes from the eggs, at which time the surface of the body, except the head papillæ, is covered with ciliated epithelium, by which means a rapid movement is effected in water or on wet places by the embryo in its immediate search of a suitable host. This it finds in a particular kind of mollusc known as the *limnæus truncatulas*—having found this small snail, the embryo begins to bore with the head papilla (which becomes longer conical and pointed), spinning rapidly round on its own axis, the cilia working vigorously and pressing the embryo against the surface of the snail; this pressure is increased by the body of the embryo being alternately drawn up and suddenly extended. The tissues of the snail are thus forced apart as if by a wedge through which the embryo squeezes its way into the body of the snail—here it degenerates into a sporocyst, in which redia are produced, and from these redia come cercaria and in this form they leave the snail, and are able at once to move about with feeedom, until coming in contact with a suitable object, such as leaves or grass, they at once attach themselves, throwing off from their bodies a kind of mucus which forms a cyst around them; in this cyst you have a minute fluke ready to be taken up by the sheep; it then takes about six weeks to become a fully grown, sexually mature capable of producing eggs. Now, the life history of the sheep fluke, unlike that of the hoose parasite, is no longer a matter of conjecture, but has been conclusively proved by Professor Thomas to whom a grant was made by the Royal Agricultural Society for an investigation of its life history, and I think, if that of the hoose parasite were as ably investigated under similar conditions we might hope for equally satisfactory results. We who are for the most part engaged in general practice have neither time nor opportunity to engage in microscopic research of such a delicate nature and requiring such undivided attention.

This history of the sheep fluke being what it is, has led me to form a theory on that of the hoose parasite, which is, I freely admit, purely speculative though it appears to me not improbable. My idea is this—the ova is deposited n the trachea and bronchial tubes of the calf, and is worked up by the ciliated epithelium of the air passages and coughed out by the animal on to the pastures. It here remains in the egg state, probably for some weeks, until the embryo is hatched; the time of year I should fix upon being October or November, when we usually experience a considerable amount of wet weather, which

must, I think, be favourable both to the embryo and its intermediary host, whatever that may be. The embryo having found its nurse or bearer, here passes the winter in the larval form, and leaving its host in the spring regains the pasture to be taken up, a minute strongyle, by the calf in the act of grazing, and so finding its way to its final resting place, by the alimentary tract and circulatory system. In support of my theory of the necessity of an intermediary bearer for this parasite, it *must*, I take it, to propagate its species, leave its final host in one of three following forms—either as an egg, an embryo, or mature strongyle. If as an egg, it can, I think, only be hatched by the agency of the sun (supposing no intermediary host is necessary), and we should then have hoose appearing in spring instead of autumn. If as an embryo, I do not see how it can exist exposed for so many months in winter (such an one as last for instance) without a nurse or bearer, for we must remember the animals are recovering long before Christmas. If as a mature strongyle they would undoubtedly be visible on the pastures from their size and colour, nor do I think it possible for either an embryo or mature worm to pass over an organ so sensitive as the larynx, without more distressing symptoms than are usually observed. Then, again, there is the fact that hoose always appears at about the same time of year and disappears with equal regularity—whether treated or not; a strong proof, to my mind, of the existence of a cycle in the life of this parasite. Again we know on the best authority, that of the late Dr. Cobbold, whom I daresay many of us remember, that the emhryo of the strongylus micrurus has been found in the *ascarus lumbricoides* or common earth worm, and to this fact I attach much importance, for if the worm be not the missing link (or intermediary host) what is the embryo doing there at all, and especially in such a suggestive form? I am aware that views wholly opposed to my theory are held by some, for instance Mr. Thompson, M.R.C.V.S., of Aspatria, who read a paper on "Hoose and Diarrhœa in Calves" before the Border Counties Veterinary Medical Association some time ago, mentions that a friend of his, an eminent microscopist, while examining a strongyle taken from the lungs of a sheep, was not a little surprised to see the posterior half of the body split open longitudinally, and a large number of young, in every way the fac-simile of the parent, roll out into the water on the slide, that they all seemed fully formed and ready for their work, thus showing the parasite to be ovoviviparous, hatching its young within its own body and not depositing eggs. I cannot help thinking this gentleman was mistaken, for if the strongyle is able to produce large numbers of young in every way the fac-simile of the parent, this reproduction it appears to me would go on indefinitely, and we should have hoose lasting possibly as long as the animals lived. Then the female strongyle is provided by nature with a birth opening about the middle of the body, which I take it is for the express purpose of the production of young.

Coming to prevention—a very good plan is to turn calves out in the daytime only, being careful that the dew is off the grass before they are turned out, for I have always had a strong suspicion that the fine cobwebby appearance on the pastures in the early morning after a heavy dew at such seasons of the year, has something to do with facilitating the movements of this particular strongyle, and I know farms where the loss from hoose has been heavy year after year, and when this plan was tried, ceased altogether; the animals certainly had the disease but always in a very mild form. Possibly a little dry food given night and morning, when housed, may in some measure account for this, at all events the loss ceased. But the *best*, and *at present*, only effectual method of prevention is to house the calves for the first year, never turning them out at all; by so doing the value of the stock is considerably raised. I speak from practical experience gained on a large farm where we suffered greatly both in cattle and sheep, the loss not ending with the

disappearance of hoose; for I always found the animals most susceptible to black-quarter, were precisely those which, emaciated by an attack of hoose in autumn had commenced growing rapidly again in spring. The mortality from hoose, which is greatly in excess of what it ought to be, I explain in this way; on nineteen farms out of twenty, spring calves are never half-reared, and why? About the middle of March cheese-making begins; or what is more common now, a milk contract is entered upon; in either case a given quantity of milk must be, and is found, *but* at the expense of the young calves. The older ones are capable of assimilating other food, but the younger ones, deprived of their natural food because they are able to digest what is given as a substitute, are turned out to grass; the weather being often cold and wet, their constitution becomes impaired, the tissues of these young and weakly calves are thinner, and consequently more easily pierced than those of the older and stronger, they fall an easy prey to a disease so insidious as the one under consideration. These are the animals, and as far as my experience goes, the *only* animals that are lost from hoose.

I have often been struck with the great superiority of autumn reared calves which have been housed, over those reared the preceding spring and turned out, and this induced me, when farming myself, to keep up all calves born after the first week in March—and with the best results, for we no longer lost any from hoose; they made good yearlings, never having received a check to their growth, a *very* important point and one not sufficiently considered by agriculturists generally, for an animal that is not thriving, far from being a source of profit, is an actual loss. If farmers once realised what they lose in a herd of twenty or thirty calves, reduced by hoose as we sometimes find them, let alone the loss from death, I think they would then be willing to carry out preventive measures, even though entailing additional present cost and trouble.

I had hoped to have laid before you some definite information on this part of my subject, as last autumn at the request of Prof. Duguid, I sent a piece of turf taken from a pasture, on which animals of all ages to the number of seventy were suffering from hoose; he, I understood, forwarded it to Prof. Brown for examination—being myself much interested in this matter I wrote to Prof. Brown asking him the result of his investigation, but I regret to say I have received no reply. I think it extremely probable that birds, such as the plover, which assemble in late autumn in large numbers on meadow land, and there pass the winter, act the part of "farmer's friend" by destroying snails, worms, &c., which are probably intermediary bearers of more than one parasite affecting our farm animals.

I have not found hoose so prevalent this season as usual, which may be due to the severity of the winter and to the exceptionally dry spring. I shall be glad to hear if my experience is general or not. If we could arrive at a certainty as to the habitat of the parasite when it leaves the calf, it would undoubtedly be of the first importance in determining the kind of dressing for the pastures, likely to be the most fatal to the intermediary host.

In conclusion, I would suggest that those belonging to our association who have clients unfortunate enough to have pastures infested with the hoose parasite, should induce them to try top-dressings of a vermicide character, such as lime, salt, or soot; they would be well repaid for the outlay by the increased fertilization of the soil, and if the dressing is applied during the winter months, that is a time when the grass is of no practical value, and the most likely time for the destruction of the intermediary host supposing (which I have no doubt is the case) there be one. As, in most cases, a special field is set apart for the "rearing calves" it would be easy to test the value of the suggestion and report on it at some future meeting. I feel sure that much valuable and interesting information would result from combined observation by a society which is numerically strong, and also counts among its members as many able men as the Mid. Counties V. M. A.

DISCUSSION.

The CHAIRMAN heartily thanked Mr. Wartnaby for his able and interesting address on a very important subject. He had gone very carefully into the question of the animals affected, the cause of the disease, and the time of year it made its appearance; he had also dealt with the treatment of the disease, and more particularly its prevention. Further than that, he had speculated on the probable life history of the parasite. Many of them had had considerable experience with hoose, but his had been somewhat limited, and he should therefore leave it to someone else to open the discussion.

Captain RUSSELL said he could not quite agree with Mr. Wartnaby on two or three points, and particularly as to Hoose occurring only in the months of August, September, and October. In his part of Lincolnshire, and in many others, it had been found in June, and in this particular year they had it in April among calves almost as soon as they were turned out. It had, in fact, proved very fatal from May until September, and almost every herd through the valley of the Witham had been more or less affected. It was at first difficult to ascertain what was the matter with the calves, because they were not troubled with a cough, but when a *post-mortem* was made they were found to be a living mass of parasites. There could be no doubt whatever that calves were turned out much too soon, and it was far better that they should be kept in for twelve months. At the same time he was bound to say that he had several outbreaks of hoose in calves that had never been out of the shed, and he knew of an instance where twenty-one calves which had only been turned out for a single day were attacked, and eighteen succumbed. On a particular farm at Sleaford there were 40 calves which had never been turned out, but when they were 10 months old the farmer lost 13 out of the 40 from hoose. The lungs of the animals were simply a solid mass of parasites. They had, however, one capital remedy against the ravages of disease—*i.e.*, intra-tracheal injection of chloroform, carbolic acid, creosote, olive oil, and turpentine. After three injections—one for each day—he had seen calves which had been gasping for breath on the ground come up in three days. The syringe he used was one brought out by Messrs. Arnold and Co., and the dose two drachms.

Mr. MERRICK had had a deal of hoose around his district, but during the last twelve months it had not been so prevalent as in previous years. Two years ago he read of the intra-tracheal injection and determined to try it. He saw some calves not more than seven months old in the last stage of hoose, and the injection he gave was two drachms of spirits of turpentine, a drachm of chloroform, and 20 drops of ac. carbol. B.P. In less than three weeks the animal that was the worst was the best of the lot, while the others quite recovered.

Mr. CARLESS, Stafford, went with Mr. Wartnaby nearly the whole of the way, and approved everything he suggested. He had had a great deal of experience in such cases, and for the last four or five years had resorted to intra-tracheal injection with very great success. He, however, did not pretend to be successful with animals that were *in articulo-mortis;* but if they could get a herd of stock just as it was showing symptoms of the disease, then was the time for introducing the injection and overcoming the complaint. If stock were allowed to remain on the same pastures, they would be in the same state again in a few days, but they (veterinary surgeons) should advise their clients to throw salt on the pastures, and then, in all probability, they would not another year be troubled with hoose. Again, if they could induce clients to put calves up at night, and give them a good liberal supply of nitrogenous food and hay in the morning, they would not need the pastures so early in the morning, and would not therefore contract the germs. The grand secret

in the treatment was the art of supporting the constitution. The calves should be kept in a dry house, and should be given pure water to drink in the night time; then if they were attacked, they had a good constitution to help them over it.

Mr. GREAVES had listened with very great pleasure to the excellent address of Mr. Wartnaby, who had given him an opportunity of learning what he had not hitherto known, for his experience in connection with the subject under discussion was little or nothing. He, however quite recognised that it was one of great importance, and knowledge upon it ought to be widely diffused.

Mr. TRIGGER was inclined to follow the paper entirely, and could find no important point on which he could be at issue with Mr. Wartnaby. He had very little doubt that the secret of success lay in the housing of animals at night, and the supply to them of 'a liberal diet. Long before the intra-tracheal injection came out, he found he could never attain any success until he had the animals housed at night, and he cared little what medicine they used so long as they could keep the cattle off the pastures where they contracted the disease. The only treatment he used with success was solution of weak dilute creoline poured down the nostrils two or three times daily. Inhalation of chlorine gas was also a successful remedy. Another important point to bear in mind was this—not to operate on more calves than the operator could control, and he would limit the number to six or eight at a time. As to the period of attack, if he had seen calves affected so early as April, May, or June, he should certainly have said that they had not got the disease. He had, however, learnt otherwise since he had been in that room, and that very fact demonstrated the usefulness of such an association. They had evidently ascertained that the parasite was not dangerous only in one particular part of the year. He attached the greatest importance to the intra-tracheal injection method, and strongly advocated the use of a proper syringe—one such as that referred to by Captain Russell, while he also pointed out the necessity of the veterinary surgeon being called in early.

Mr. BARRETT, Nuneaton, supported intra-tracheal injection, and said he had found prussic acid (pure) with camphorated oil very valuable as an injection.

Mr. BURCHNALL, Loughborough, had had considerable experience with intra-tracheal injection, but did not regard the operation so easy as they had been led to suppose. It was very essential that the fluid should be injected properly into the trachea, and there was a great probability, owing to the difficulties attending the operation, of causing a deal of swelling, in which event nothing could be done again for a week. He used the same injection as that stated by Mr. Merrick with this exception—he (Mr. Burchnall) used half-a-drachm of chloroform instead of a drachm.

Capt. RUSSELL said they could always tell when the point of the instrumeut was introduced into the trachea. The calf made a motion of swallowing, and then the fluid could be injected without fear. From experience he found two things occur. One was that you felt you had gone into space, the other was that the calf invariably swallows.

Mr. CARLESS said he liked to take some time in introducing the instrument. He always cut down half or three-quarters of an inch through the skin, and then ascertained that the canula was in the trachea by pushing open the little stilette and listening to the breathing going on through the canula. It this precaution was taken they would never get into the tissues.

Mr. SMITH, Tunstall, considered the paper a very interesting one, and while he agreed with the greater portion of what had been said about the treatment, and cordially supported the intra-tracheal method, he at the same time was not entirely in favour of the old treatment by turpentine being discarded. Whatever remedy might he introduced, they could not ignore the fact that the drug was

in the blood before it operated. If they injected turpentine and chloroform per rectum they would soon detect it in the breath, and it would destroy the parasites.

The PRESIDENT said he had not seen the disease for 10 years, and since then the intra-tracheal method had been introduced. Of the success of that he was very glad to hear. As to syringes, the one he used for their black-leg experiments was very good for intra-tracheal injection. The muzzle of the syringe simply fitted on without any screw, and it was quite strong enough. They could fill the syringe, re-introduce it into the muzzle, and inject into the trachea.

Mr. WARTNABY replied, and said he wished in the discussion that had taken place, that attention had been directed to the parasite itself, for that was what he had been extremely anxious about in writing his paper. He would also have liked to hear something said in favour of top dressing of a vermicide character, by which he thought the parasite could be effectually attacked. If members would endeavour to induce their clients to try this top dressing at different seasons of the year, and would collect the results and lay them before a future meeting they would be considerably aided in treating the disease. He was surprised at Capt. Russell's observations as to the parasite appearing so early in the year.

A hearty vote of thanks was accorded Mr. Wartnaby for his paper, on the motion of Mr. STANLEY, seconded by Mr. MERRICK.

Mr. OLVER gave notice of motion for some change to be made in the day of meeting.

It was afterwards agreed that the next gathering should be held in Birmingham.

Captain RUSSELL exhibited specimens of a calf's leg and his improved chloroform muzzle.

Subsequently the members dined together under the presidency of Mr. Malcolm, with Mr. Wartnaby in the vice-chair, and a very pleasant evening was spent.

H. J. DAWES, *Hon. Sec.*

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of the above Society took place at the County Hotel, Newcastle, on November 20th, 1891, the President (A. Hunter, Esq.) in the chair. There were also present—H. Hunter, C. Stephenson, J. Gofton, J. W. T. Moore, J. E. Peele, A. Peele, C. Hunting, F. Finney, J. R. Crone, D. Macgregor, G. R. Dudgeon, J. B. Nisbet, W. Grieve, D. Macgregor (Newcastle), J. E. Tudor, W. Stephenson, Professor M. Fadyean, G. Elphick, and W. A. Hancock (members); and Drs. Murray, Hunter, Gofton, Ellis, and Davies; Professor Bowhill; and Messrs. C. Brown, T. Jarvie, J. Nestleton, and J. Rider (visitors).

Mr. J. R. Crone was unanimously elected a member of the Association.

Election of Officers.

The following gentlemen were unanimously elected to serve for the ensuing year:—Mr. G. R. Dudgeon, President; Messrs. A. Peele and W. Hunter, Vice-Presidents; and Mr. W. Ashton Hancock, Secretary and Treasurer; Messrs. A Hunter and E. Elphick, Auditors.

The President, Secretary, Mr. Elphick, and Mr. Moore were chosen as the Dinner Committee.

Letters of apology and regret for being absent were received from Professor. Cope, Duguid, M'Call, Walley, and Penberthy; Sir H. Simpson and Messrs J. Simpson, W. Awde, W. Gartside, Mayor, and F. Stevens.

Professor MCFADYEAN then delivered a most interesting lecture on Pleuro-

pneumonia, with special reference to the recent case that occurred at Deptford in a bullock from America, and illustrated his remarks with specimens projected on a screen by means of an oxy-hydrogen lantern, and also by microscopic specimens. The specimens exhibited included, besides sections taken from the Deptford ox, specimens taken from home cattle slaughtered for pleuro-pneumonia, and none of the members present were able to distinguish the American specimens in the mixed series exhibited. At the outset of the Professor's remarks, he mentioned the fact that he desired particularly to ask the gentlemen present at the meeting the question—"Was the ox landed from America at Deptford the subject of pleuro-pneumonia?" He felt very confident that after the evidence brought forward by him, the answer would be that it was. The Professor then gave a very clear exposition on the post-mortem appearances found in the chest, and particularly with reference to the lesions recognised by the naked eye, and put before the meeting. On the one side, the evidence of the American gentleman who, with Professors Williams and Bowhill, said it was not pleuro; and on the other, the opinions given as to its being pleuro by Mr. Holmans, the Inspector at Deptford, Professors Brown, Duguid, Cope, Walley, and himself; and also stated to the meeting that during the past summer he had personally submitted portions of the lung of the Deptford ox to eminent veterinary pathologists in Denmark, Germany, and Austria—viz., Professor Bang, Copenhagen; Professor Schutz, of Berlin; Professor Johne, of Dresden; Professor Csokor, of Vienna; Professor Kitt, of Munich; and Professor Lüpke, of Stuttgart. Every one of these eminent specialists without hesitation declared that the case had been one of contagious pleuro-pneumonia. He had also shown the specimen to Mr. Finlay Dun, F.R.C.V.S., who emphatically declared that the case was one of typical pleuro-pneumonia.

Dr. HUNTER, Lecturer on Physiology in the New Veterinary College, on the invitation of the Chairman, then addressed the meeting. He exhibited a lantern-photograph of a section from the lung of the Deptford ox, and described at great length the histological changes shown in it. These, he contended, were characteristic of catarrhal-pneumonia, and although he had at first sight of the lung of the Deptford ox, inclined to the opinion that the case was one of contagious pleuro, his further investigation of the lung had convinced him that it was a case or catarrhal or broncho-pneumonia. In support of his opinion, he exhibited on the screen of a photograph from the lung of an ox affected with pleuro-pneumonia, this showing no catarrhal changes. He also referred at length to the investigation of Monsieur Nocard, of Paris, regarding an infectious form of catarrhal-pneumonia discovered by him in some American cattle exposed in the Paris market. Dr. Hunter contended that the Deptford ox had been the subject of the same disease.

Professor BOWHILL, of the New Veterinary College, supported the opinions expressed by Dr. Hunter. He had, he said, been able to find in the lung of the Deptford ox *bacteria*, which, in point of shape and size, agreed with those found by Monsieur Nocard in infectious broncho-pneumonia, or the so-called corn stalk disease. That these *bacteria* were identical with those described by M. Nocard he had not been able to prove absolutely, as there was no opportunity to test their effects by inoculation.

A lengthy discussion on the part of the members of the Society then took place, and every speaker, including Mr. Clement Stephenson, Newcastle; Mr. Hunting, senior, South Hetton; and Messrs. Moore, Hunter, and Elphick, of Newcastle, after reviewing the evidence laid before them by Professor McFadyean on the one hand, and Professors Hunter and Bowhill on the other, declared in favour of the view that the Deptford ox had been the subject of contagious pleuro-pneumonia, and strongly upheld the action of the Board of Agriculture in the matter.

Professor McFADYEAN, in replying at the close of the debate, said that he was much gratified at the conclusion arrived at by the meeting. He confessed that he had listened with considerable impatience to Dr. Hunter's description of the lantern-photograghs. The catarrhal-pneumonia, shown in the photograph of the lung of the Deptford ox, he could parallel from almost every case of genuine pleuro-pneumonia occurring in British cattle. Since Dr. Hunter had spoken, he had submitted to him a number of specimens under the microscope. One of these, Dr. Hunter admitted, showed lesions similar to those that he had found in the Deptford ox. This lung, Professor M'Fadyean informed the meeting, was from an Edinburgh cow, slaughtered with several others while suffering from typical contagious pleuro-pneumonia.

At this stage of the proceedings, Professor McFADYEAN, before the meeting, passed a specimen to Professor Bowhill, and asked him, after examination, to say what in his opinion the lesion was. Professor Bowhill promptly declared it was catarrhal-pneumonia. This also, Professor McFadyean explained to the meeting, was from a case of undoubted British contagious pleuro-pneumonia. In conclusion, he said that after the day's proceedings and the opinions which he had been able to lay before them from eminent Continental authorities, no reasonable person could entertain any doubt that the lesions present in the lung of the Deptford ox were not distinguishable from those of contagious pleuro-pneumonia, and in the absence of any clinical history it must be held that the disease was genuine contagious pleuro-pneumonia.

The result of the opinions given to the meeting by the various speakers tended to show that the Deptford ox was the subject of pleuro-pneumonia, and also that the best methods of recognising the disease were by the naked eye and hands and that when these methods failed, little reliable assistance could be obtained from the examinations of microscopic sections, that is to say as far as determining it to be absolutely a case of pleuro was concerned.

It is matter for regret that notes of Professor McFadyean's lecture, and the contributions of Dr. Hunter and the other speakers could not be taken, owing to the room having to be darkened, and there not being too much space for the good attendance of members; but this will not happen again, as through the kindness of the Council of the College of Medicine, a similar meeting could be held in one of the rooms of the College, and this will be a great advantage from every point of view.

The meeting then passed a cordial vote of thanks to Professor McFadyean for his lecture, and also to Dr. Hunter and Professor Bowhill for their presence, which closed one of the most interesting meetings held by this Association.

Through the kindness of Mr. Hunting, of South Hetton, a very interesting case was on view close at hand, and was seen by nearly all the members, but unfortunately time did not permit Mr. Hunting to bring the question before the meeting. The subject was a "Brown Gelding," with obliterated Lachrymal duct on off side, with considerable disfigurement of that region. Many had not seen a case similar, so it is hoped that a communication will be made at the next meeting concerning it.

W. ASHTON HANCOCK, *Secretary.*

THE CENTRAL VETERINARY MEDICAL SOCIETY.

AN ordinary general meeting was held at the Royal College of Veterinary Surgeons, on December 3rd, 1891. The following Fellows were present:—Messrs. A. L. Butters, H. W. Caton, J. A. W. Dollar, Veterinary Lieut.-Col. Duck, W. H. Farrow, A. E. Gostling, W. Hunting, Veterinary Major Kettle, F. C. Mahon, P. McOnie, Veterinary Capt. J. Matthews, W. J. Mulvey, T. Moore, Professor Pritchard, G. H. Pickell, Veterinary Capt. F. Raymond, J. E. Rickards, G. Reddish, H. G. Rogers, A. Rogerson, F. Samson, Professor

Shave, C. Sheather, S. Slocock, W. Willis, E. A. West, A. Wheatley, W. N. Wright, S. Villar. The visitors were Messrs. C. T. Bray, D. Duff, R. C. Irving, Farmer Miles, J. H. Paterson, E. Russell, Evans, W. Rattee, and E. Taylor.

Mr. Wm. Roots, the President, was in the chair.

A letter was read from Mr. A. Broad, regretting that he could not attend; and from Professor Walley who, although unable to attend from illness, stated that he had never had any trouble in suppressing glanders when full control was given. Professor Walley also thought that owners were as much entitled to compensation for glanders as for pleuro-pneumonia in cattle if the disease was not concealed.

The Hon. Sec. stated that he had received a letter from Mr. J. Woodger, the Hon. Treasurer, stating that owing to the recent death of his wife he was unable to attend. Instructions were given to the Hon. Sec. to write and convey to Mr. Woodger the deep regret of the Society, and to express sympathy.

Veterinary Capt. B. Glover, Old Charlton, S.E., and Mr. Harold Leeney, 40 New Bond Street, were unanimously elected Fellows of the Society.

Mr. R. C. Irving, F.R.C.V.S., was nominated for Fellowship of the Society.

Farmer Miles gave some account of his operation of castration, stating that his instruments had been pirated, and that his book had not met with the sale he expected. He invited the Fellows to interrogate him as to his operations, etc., but no questions were asked, and the business of the meeting was proceeded with.

Mr Villar read a paper as follows, on

The Prevention and Suppression of Glanders and Farcy.

For the prevention and suppression of a disease, the first step to determine is its cause; fortunately, in the disease under consideration, the origin or cause is already thoroughly understood. Glanders and Farcy are different forms of one disease, and are due to one cause only, namely to the entrance into the body *from without* of a specific bacillary organism or germ.

I am anxious at the commencement of my paper to lay especial stress on this point, because in a recent edition of a veterinary work by a member of our profession of world-wide reputation, it is stated that glanders and farcy originate *spontaneously* in the horse, and that among the remote causes of the disease are the debilitating influences of old age, bad food, overwork, exhausting diseases, and general bad management; it is also said that the disease may be caused by miasma *generated* in localities where numbers of horses are congregated together, and also from crowding horses, with want of ventilation, as in voyages at sea, etc., and further that these causes may be said to produce glanders—

1st. By causing the introduction into the blood of vitiated or decomposing material generated in the external surroundiugs of the animal;

2nd. By inducing the formation of degenerated material within the animal system; and

3rd. By preventing the excretion of the degraded constituents normally generated by natural tissue changes.

Having regard to the eminence of the author of this work, it is with considerable diffidence that I ask you to discredit these opinions; and I would submit to you that, were the debilitating influences of old age, overwork and improper sanitation sufficient to produce glanders and farcy, outbreaks would be continually occurring in all parts of the country. But this is not the case, as I shall point out presently, and, as you may see by the map which our secretary has been kind enough to prepare, the disease is practically confined to London and the suburban counties, and is absolutely unknown in many parts of the king-

dom where long overwork, and improper sanitation of course exist. Again, did long voyages and overcrowding on board ship cause the disease, surely outbreaks would have occurred among the hundreds of horses which have arrived in this country from South American ports during the past year. These animals arrive for the most part in an emaciated condition, many die on the passage, and others on landing are so bruised and battered as to be pitiable objects; yet no outbreak of glanders or farcy has occurred amongst them. It seems, therefore, that bad influences such as have been enumerated are not of themselves sufficient to produce glanders or farcy, and I would further submit to you that no combination of bad influences will cause glanders and farcy to arise spontaneously. For an outbreak to occur, it is necessary that glanders should have previously existed—the disease does not, and cannot arise *de novo*.

Such of you, gentlemen, who were at our meeting twelve months ago, when Professor Shave gave an address on glanders, will remember that he exhibited to us a cover-glass preparation of the organism of glanders from pus from an affected horse. He pointed out that the lesions of glanders and farcy with which we are all so familiar, are due to the irritation set up in the tissues by this bacillus or its products, and at the same time he entered deeply into the minute pathological processes and microscopic anatomy of this disease. Into such details I shall not attempt to go, but I ask your attention this evening more particularly to the manner of spreading of glanders, the extent of the prevalence of the disease in this country, and the steps which may be necessary to eradicate it.

As to the spreading of glanders—if then the presence of this bacillus, this specific virus, is necessary to an outbreak of glanders and farcy, it will be perhaps well to consider where it exists, and by what means it gains access to the bodies of healthy animals. It is found outside the animal body in the nasal discharge, and in the discharge from the ulcers on the body and limbs of affected animals; also, probably, in acute cases of glanders, in the air expired by the lungs; it is evident, therefore, that a horse suffering from glanders or farcy is a living manufactory of its specific virus, and if that allowed to live he will distribute it upon manger, wall, and water-trough, in fact, upon anything with which he comes in contact. The organisms are thus free in the outside world, waiting, as it were, to gain access to healthy animals into whose bodies it may enter in one or three ways—(1) Either through the mouth and digestive organs, (2) by means of the respiratory tract, or (3) through wounds or abrasions of the skin. As to the first method of entrance, it was some years ago experimentally established by Professor Simonds that glanders may be produced in a healthy horse, by causing him to eat the virus with his food; indeed, the Professor tells me he came to the conclusion that the spread of glanders in studs of horses depended chiefly on feeding from the same mangers and drinking from the same pails as affected animals. It is, however, somewhat remarkable that intestinal lesions in glanders are rare; in the somewhat analogous disease—tubercle animals experimentally fed on tubercular matter appear to generally have ulcers in the small intestine. As regards the entrance of the organism by the respiratory organs, it is held by many eminent veterinary surgeons that it does not gain access in this way; they say, in fact, that glanders is not an infectious disease—that it cannot be communicated from animal to animal through the medium of the atmosphere. Compared with pleuro-pneumonia of cattle and swine fever, its infectious power is undoubtedly slight; but my experience leads me to believe that at all events in crowded, ill-ventilated and warm stables—the atmosphere will become so contaminated by glandered horses as to produce the disease when breathed by healthy animals; at all events, up to now it has not been proved that glanders cannot be contracted in this way, and until such evidence is

forthcoming we are not, I think, justified in considering it as non-infectious. By experimental inoculation, it has abundantly proved that the organism will gain access to the system through wounds and abrasions of the skin.

Having gained access, symptoms of glanders or farcy may develop in an uncertain and variable period—it may be ten days, it may be ten months. The disease is recognised by the French law to occur in ten days after exposure to infection. I have known a well marked case to develop in that short time, and also a case in which the symptoms did not develop, or at all events were not observed, until over six months after contact with a diseased animal.

Now as to the distribution of glanders and farcy. In the last annual report of the Veterinary Department of the Board of Agriculture, in a most interesting and instructive report by Professor Duguid, which I shall take the liberty of quoting considerably. It is there shown that 1,765 horses were returned in England as affected with glanders and farcy during 1890, and that in the same year only six cases were reported in Scotland and one only in Wales. Commenting on these figures, the author of the report says: "In Wales glanders does not seem to have a permanent existence, and in Scotland the only permanently infected centre is Glasgow, and that in the form of farcy this disease does not appear to have a permanent existence in any part of Wales or Scotland."

The number of outbreaks of glanders and farcy reported in England alone last year, was 952; the whole of these outbreaks with the exception of 32 occurred in London and home counties, viz.: Middlesex, Essex, Herts, Surrey and Kent; and moreover, 92 per cent. of the cases reported as affected with glanders, and 95 per cent. of those reported with farcy were in horses living in London and Middlesex. On this point Prof. Duguid says: "It will be seen from these figures that London and the counties immediately surrounding it are, and always have been the chief centres of these diseases, more especially London and Middlesex." Shakespeare says, "Some are born to greatness and others have greatness thrust upon them." Now the greatness of the county of Middlesex as a centre of glanders, is undoubtedly thrust upon it. I can without hesitation affirm that four-fifths of the outbreaks of glanders and farcy which occur in my district of the county are in what may be described as London horses, *i.e.*, horses that have quite recently been sent from London, or bought in London, or the nature of whose work takes them to London. From the home counties named farmers' and carriers' carts continually pass up the roads to London, and London horses come into these counties in their work, for a holiday at grass in the spring and summer months, and at all times of the year to gain health and strength in what might be called horse convalescent homes in the country; several large London firms have this kind of infirmary for their horses in the county of Middlesex. It is not, as a rule, the Middlesex horse that dies or is slaughtered for glanders; it is the horse from London, bought by a countryman, or sent into the country for some one of the purposes named. It may, I think, be fairly taken that the disease is prevalent in the home counties from their importation of London horses, and that London is the home of glanders in this country. This localization of the disease makes its suppression and ultimate eradication feasible, and you will all, I feel certain, entertain the opinion that its eradication is desirable.

When the immense monetary loss, estimated by a competent authority at £40,000 per annum, and the occasional loss of human life by this disease, is taken into consideration, no one can doubt that its suppression is desirable for the national welfare. During the past five years, the number of outbreaks in this country have not varied much from year to year; but there is a decrease in the year 1890. This diminution is not, however, sufficient to warrant us in thinking the disease is likely to permanently decrease, and it appears to me that so long as the provisions of the Contagious Diseases

(Animals) Act relating to glanders, farcy, and suspicious animals remain as at present enforced, we are not likely to make headway against the disease. In the first place, the Act itself appears weak; and, secondly, the powers conferred by it are not, perhaps, made the most of by the Local Authority.

As regards the Act, there is unfortunately no authority by which an inspector may order the immediate slaughter of a glandered horse. Provided the owner keeps his glandered animal isolated, there is no power to compel him to slaughter it until the expiration of 14 days; even after this delay a reasonable time must be allowed him for the slaughter to be carried out, and then if he fails to kill he may be prosecuted and deemed guilty of an offence, unless he shows to the satisfaction of the justices that the slaughter is for any reason unnecessary or inexpedient.

But although the provisions as to glanders are weak, the regulations as to farcy and suspicious cases are weaker. A man after giving notice of the existence of the disease on his premises, can, if he isolates his farcied or suspicious horse, keep it alive as long as he thinks fit, and as soon as it ceases to show any marked indication of the disease can dispose of it alive without committing an offence against the Law. But it the Act is weak as regards slaughter, it confers great powers on the Local Authority (Section 61) to make regulations for prohibiting the movement of any horse or horses that have been in contact, or in the same building or field, with any animal affected with glanders or farcy, as long as the disease continues to exist on such premises, and until their disinfection has been carried out.

Gentlemen, to exterminate this disease it should be made illegal to keep any animal affected with glanders or farcy alive for more than twenty-four hours after the recognition of its existence, and the provisions of the Act as to movement of animals in contact would have to be more rigidly enforced. Most large stud-owners recognise the necessity of immediately stamping out the disease from their stables; they kill at ance all markedly affected animals, and isolate or dispose of the horses which are suspicious, or have been in contact; other men will keep a horse affected with chronic glanders or farcy under treatment in the hope that the symptoms may diminish sufficiently to allow of the animal's sale—there can be no doubt that this traffic in farcied, suspicious, and "contact" animals is the chief factor in spreading the disease from stable to stable. You are all aware that a gentleman who is here this evening, and who, I am glad to say, has promised to speak—I refer to Mr. Hunting, has recently been taking very active steps to promote the giving of compensation to the owners of horses slaughtered whilst affected with farcy, in the same way that compensation is given in pleuro-pneumonia of cattle and swine fever. Let me say at once that I agree with Mr. Hunting in his scheme, so far as it goes, but it does not seem to me to go far enough.

(To be continued.)

MONTREAL VETERINARY MEDICAL SOCIETY.

THE Montreal Veterinary Medical Association held its first meeting of the session 1891-92, on October 15th.

The following were elected office-bearers for the ensuing year:—

Dr. Charles McEachran, *President* (re-elected).
Dr. M. C. Baker, *First Vice-President.*
Dr. Mills, *Second Vice-President.*
Mr. Alex. T. Robertson, *Secretary-Treasurer.*
Mr. J. H. Seale, *Librarian.*

Twenty-two new members were elected.

The second meeting of this session was held on Oct. 29th. Dr. C. McEachran occupied the chair. A vote of thanks was tendered Dr. Mills for his gift to the library of one of his recent works entitled "How to keep a Dog in the City."

A committee on experiments in drugs was formed; this committee to report the results of the experiments at the meetings.

Mr. Ramsay reported a case of "Paralysis of Pelvic flexure of Large Colon." The animal showed symptoms of indigestion or impaction. It responded quickly and freely to a cathartic, but four days afterwards showed every symptom of rupture. Death.

Post Mortem showed a large accumulation in the pelvic flexure of great colon, and a rupture of all its coats, which rupture on close examination proved to be ante mortem. At the inferior side of this large accumulation was a small opening about two inches in diameter, which served for the fæces to pass through, without this mass being affected. The discussion of this case was heartily entered into by a large number of members, many of whom had seen similar cases. Dr. Baker related a case in which the symptoms much resembled those exhibited in Mr. Ramsay's case, although on making a post mortem, he found the cæcum to be impacted.

Mr. Plaskett read a paper on "Glanders and Farcy." He took objection to Dr. Williams' statement that this disease might arise from surrounding septic conditions or as a complication to debilitating diseases, maintaining that these circumstances are merely predisposing causes decreasing the resistance of the animal to the attack of the germ. In speaking of the treatment of this disease, he criticized the reported cures from intratracheal injection of iodine. The difficulty of diagnosis was fully discussed, the general opinion being that the production of the disease in other animals by inoculation was the only positive means of diagnosis.

The third meeting of this session was held on November 19th. The President in the chair. Mr. Wills, secretary of committee on experiments in drugs, reported having experimented with sulphate of eserine. The drug was tried on two different animals in different ways. No 1.—Normal condition of animal at 8.30 p.m.: pulse, 45; respiration, 12; temperature, 100 4-5. One grain of eserine was dissolved, and given in small venus injections every two minutes, for ten minutes, at the end of which time the animal began to show uneasiness; pulse not increased, but stronger and fuller; muscle tremors in shoulder and flank; dilatation of pupil and very loud intestinal murmurs. Five minutes after discontinuing the drug the pulse was 46; respiration, 14; temperature, normal. Animal No. 2.—Not so strong as first one. Normal condition: pulse, 42; temperature, 100; respiration, 8. At 9.10 p.m. gave one grain of sulphate of eserine, in one injection in jugular vein. In fifteen minutes, very pronounced muscular twitchings and tremors all over body, with excessive salivation, pupils dilated and constant champing of jaws. At 9.30 p.m., there was a free evacuation of fæces, with two more following at intervals of two minutes. The committee also reported having made some experiments with chloroform, as an anæsthetic on horses, but deferred their report till later, as further investigations are under way, when they hope to present some valuable deductions as to chloroform and ether anæsthesia.

Mr. Seale reported a case of Rupture of the Stomach, which presented the usual symptoms, and was diagnosed as such.

Post Mortem showed the duodenum and pyloric end of stomach to be completely obstructed by bots. The rupture was located in greater curvature towards the cardiac end. There was an animated discussion in which it was

shown that vomition in the horse was possible without presence of rupture. Dr. C. McEachran reported a case of a horse belonging to Shedden Company that was subject to attacks of colic, every attack being attended with vomition.

A paper on Laminitis was read by Mr. Ramsay, who took the view that Laminitis was more a secondary than a primary affection, being preceded by general indisposition or some internal febrile condition. A lively discussion on treatment ensued; the essayist's recommendation of hot fomentations in the congestive stage was criticized, several gentlemen claiming that cold would have a more beneficial effect.

THE VETERINARY ASSOCIATION OF MANITOBA.

A meeting of this Association was held in the City Chambers, Brandon, 22nd July, 1891, President DUNBAR in the chair. Present:—Messrs. Torrance and Fisher, of Brandon; Barr, of Minnedosa; Spiers, of Virden; Livingston, of Melita; Henderson and McMillan, of Carberry; Hopkins, of Hartney; Roe, of Neepawa; Morrison, of Glenboro; McNaught, of Rapid City; Young, of Maniton; Taylor, of Portage-la-Prairie; and the Secretary, Mr. Rutherford, also of that town; Mr. Harris, of Moosomin, Assiniboia, was present as a visitor. Letters and telegrams from various other members, expressing their regrets at not being able to attend, were read by the Secretary. After routine, the question of the prosecution of non-qualified practitioners, occupied the attention of the meeting for some time, and a definite course of procedure was agreed upon. The Association then went into Committee of the whole to discuss a code of Bye-laws laid before them, and this matter having at length reached a satisfactory settlement, Mr. J. F. Fisher was called upon to read his paper on the subject of Veterinary Dental Surgery. This essay proved both interesting and instructive, and elicited considerable discussion, in which most of those present took part. Among other points, the question of the injury caused by the presence of "wolf-teeth" was raised, the majority of the members appearing to be of the opinion that, as a general rule, little or no trouble was thereby induced.

Mr. YOUNG produced a specimen of tuberculous lung, with a graphic account of the case from which it had been procured. This led to an animated discussion on tuberculosis, and the recent researches and discoveries in regard to the nature and spread of that malady.

Mr. TORRANCE exhibited a specimen of vermicular ulceration of the stomach of the horse, accompanied by drawings of the parasite causing the lesion.

President DUNBAR read an exceedingly interesting account of a case of obstinate impaction of the colon, due to an over-feed of shorts, which terminated fatally; the animal, a cart mare, having lived without passage of fæces for the long period of 357 hours.

An interesting debate followed Mr. Dunbar's paper, several members relating their experience with similar cases, in which every available means had been tried to induce the expulsion of the impacted ingesta.

It was moved by Mr. LIVINGSTON, seconded by Mr. SPIERS, that, in view of the long distances necessarily travelled by members in attending meetings of the Association, the Secretary be instructed to communicate with the various railway companies, in the hope of obtaining reduced rates of fare upon such occasions.

A hearty vote of thanks having been tendered to the Mayor and Council of the city of Brandon, for the use of the Chambers, the meeting adjourned.

J. G. RUTHERFORD, *Secretary-Treasurer.*

PATHOLOGICAL SOCIETY OF LONDON.

At the meeting of this Society, on December 1, Dr. Bland Sutton exhibited an

IMPLANTATION CYST FROM AN OX,

which was found in the subcutaneous tissue of the axilla of an ox. The cyst was as large as a billiard ball, lined internally with skin and filled with shed hair. These cysts probably arose from small particles of skin embedded or inverted into the subcutaneous tissue as the result of "prods" administered with the blunt-pointed driving sticks employed in driving cattle.

Mr. BARKER said that in similar cases in human beings which he had examined, the cyst consisted of a fibrous wall with a lining of epithelioma, but no other skin elements were present.

Mr. SUTTON said that the cyst wall looked exactly like the skin of the animal, but that it had been too badly preserved to allow of satisfactory sections being made for microscopical examination.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

AT the Monthly Council, held on December 9th, Sir JOHN THOROLD reported that Professor Brown had written for the next number of the Journal an article on the subject of abortion in cattle. At the request of the Committee, Professor Brown had undertaken to include in his paper a note upon the effect of ergot in relation to abortion. Of the £600 granted to the Committee for the year 1891, £552 14s. had been expended, and the Committee moved for a renewal of the grant, £500 of which was intended to be allocated to the Royal Veterinary College for the study of comparative pathology and bacteriology. They had met nine times and made nine reports during the year.

Professor BROWN had presented the following report:—

PLEURO-PNEUMONIA.—In the course of the twelve months during which the Pleuro-pneumonia Act has been in operation, September, 1890, to September, 1891, 295 outbreaks of the disease occurred; 1,188 cattle affected with pleuro-pneumonia were slaughtered, and 13,134 cattle which had been in contact with diseased beasts or otherwise exposed to infection were also killed. To these may be added 243 cattle which were suspected to be suffering from disease, making a total of 14,565 cattle slaughtered by order of the Board.

In the course of the earlier part of the twelve months the disease existed in thirty-four counties in Great Britain—viz. twenty-five in England, and nine in Scotland, but during the last month of the twelve, viz., August, it was confined to seven counties in England and one in Scotland.

In the past three months, September, October, and November, there were only twenty-six outbreaks of pleuro-pneumonia in Great Britain, and these were confined to seven counties in England and one in Scotland. In the corresponding period of last year, when the Board of Agriculture began the work of stamping out the disease, there were 116 fresh outbreaks.

ANTHRAX.—During the month of November there were twenty-five outbreaks of this disease in Great Britain. They occurred in the counties of Dorset, Durham, Kent, Leicester, Surrey, Sussex (East), Warwick, Wilts, York (W.R.), and Aberdeen. There were forty-nine animals attacked, one of which was killed, thirty-eight died, and four recovered.

SWINE FEVER.—This disease is now and has for some time been decreasing. In the month of November there were 284 outbreaks reported, an average of seventy-one per week, whereas in October the outbreaks averaged eighty-eight per week. The number of swine attacked in November was 1,874. There were during the month 860 diseased pigs killed, 934 died, 277 recovered, and 371 remained alive when the return was made up.

Reviews.

TRAITE DE THERAPEUTIQUE ET DE MATIERE MÉDICALE VÉTÉRINAIRE. By M. KAUFMANN. (Paris: Asselin and Houzeau, 1892.)

Some time ago M. Kaufmann, Professor of Physiology and Therapeutics at the Afort Veterinary School, brought out an excellent work on veterinary materia and therapeutics. A new edition has just been issued, and advantage has been taken of the opportunity to make it almost a new work. The plan has been changed, and beneficially, as it greatly simplifies the arrangement, while rendering it easier for reference. The work is divided into three parts, the first part containing general observations with regard to absorption, modes of administration, mutations, accumulation, doses, and choice of medicaments. The second part embraces a succinct, but very complete, description of the physiological and therapeutical effects of each medicament—the alphabetical order being adopted as the simplest and readiest for those who require to refer to this section. The preparations of each drug are carefully indicated, as well as the ways and modes of administration, and the therapeutic and toxic doses. The third treats of medication. In this the principal morbid conditions are dealt with, and the proper means with which to combat them. The description of each medication is accompanied by a list of the curative agents to employ, and also the principal preparations which are recognised as the most efficacious, the medicaments being classified according to their physiological effects and their therapeutical indications.

In addition, everything relating to preventive inoculations, to asepsis, antisepsis, and disinfection is described with special care. In this way the work is very complete—more so than any similar treatise on the subject in English. All the substances recently introduced into therapeutics receive ample notice, and their use is pointed out in such a manner as should prevent mistakes or accidents. The formulæ are very abundant, and many of the recipes are novel. The book, which contains over 750 pages, is altogether a masterpiece of erudition and research; it embodies the results of much labour in the field of physiology and medicine, and the information it affords must confer great advantages on the veterinary practitioner and student on the other side of the channel. The rapid progress made in veterinary therapeutics in recent years is well exemplified in Kaufmann's most creditable production. It may be added that the work is thoroughly well got up—typography, paper, and binding being all that could be desired.

A PRACTICAL GUIDE TO MEAT INSPECTION. By THOMAS WALLEY, M.R.C.V.S. (Edinburgh and London: Young J. Pentland, 1891.)

A second edition of Professor Walley's manual on meat inspection is the best proof of its utility and popularity, considering that it is not very long since the first edition was issued. We favourably noticed the latter, and can only repeat our praise of the work in its new issue, which is in every way worth of commendation.

A MANUAL OF SADDLES AND SORE BACKS. LECTURE ON SADDLES AND SADDLERY, BITS AND BITTING. By FRED SMITH, Army Veterinary Department.

The subject of saddles and sore backs has for very many years engaged the attention of those who are interested in maintaining army horses efficient in the field—just as the question of boots and sore feet has received notice from every general who understands how important it is that infantry should march long distances without breaking down from lameness. Professor Smith, of the Army Veterinary Schools at Aldershot, has done well to prepare a manual on the subject for the use of the mounted corps, which is issued under official authority, and deals with the matter in a manner which has not been attempted in this country. The anatomy and physiology of the horse's back

are first dealt with; then the saddle and saddle-fitting receive notice; and, finally, sore backs—how they are caused, prevented and remedied, as well as inspected—come in for a large share of comment. On these points the writer speaks with the authority of experience, observation, and investigation; and his remarks are further elucidated by woodcuts which demonstrate his meaning. If the hints given in the manual are adopted, there can be no doubt that the serious inefficiency caused by sore backs in cavalry regiments would be greatly reduced. Ignorance and carelessness have a large share in the production of this evil, and the mere fact that a manual on the subject is accessible to everyone who rides a horse, will leave no excuse for ignorance; though it may not do much towards averting carelessness. It need scarcely be added that we entirely concur in the writer's views.

The lecture on Saddles and Saddlery and Bits and Bitting, was delivered before the Aldershot Military Society, and is on the same lines as the manual. Stress is laid by the lecturer—as it has been by many others before him—on the very heavy loads carried by cavalry horses, and this is certainly a matter that should be remedied—and no doubt would be remedied on active service. The lumber the cavalry soldier is now encumbered with would rapidly disappear when it was found that it impeded movement and ruined horses. It is wonderful how little is required by a man who knows how to rough it. We have spent three weeks in the saddle, travelling long distances nearly every day, and carrying nothing more than we stood in. Surely cavalry men could do the same.

La Cerimonia e le Feste del Primo Centenario d. R. Scuola Superiore di Medicina Veterinaria di Milano. (Milan, 1891.)

We have already noticed the large work prepared for the centenary of the Milan Veterinary School by its Principal, embracing the history of that institution from its foundation, and showing its present position. We have now an official account of the ceremony and festival with which the centenary was celebrated last September, and they appear to have been carried out with great brilliancy and rejoicing. The account fills more than 80 pages of grand 8vo., and is very inspiriting reading. Messages of congratulation were sent from every Veterinary School in Europe except those of Great Britain. This country was only known to exist—in a professional sense—by letters of felicitation from the President of the Royal College of Veterinary Surgeons, Veterinary-Captain Raymond, and Dr. Fleming.

Traite des Maladies Parasitaires des Animaux Domestiques. By L. G. Neumann. (Paris: Asselin and Houzeau, 1892.)

This grand work by Professor Neumann, of the Toulouse Veterinary School, has reached a second edition in three years—striking testimony to the demand and the need there was for it. As the book will appear in a few days in English, it will only be necessary to say here that there is no treatise on the subject to equal it, either in the medicine of man or that of the domesticated animals. Short as has been the interval since the publication of the first edition, the second contains much new matter of an important and interesting kind, while the illustrations have been increased to 364. So highly has the work been appreciated in France, that the author, among other acknowledgments of his scientific and most valuable treatise, has received the Vernois prize of 1889 from the French Academy of Medicine, and the Gold Medal of the National Agricultural Society of France. That country knows how to encourage earnest workers.

The Structure of the Horse's Foot and the Principles of Shoeing. By Professor G. T. Brown, C.B. (London: John Murray, 1891.)

The title of this pamphlet would lead to the expectation of something interesting and instructive on the subject of horse-shoeing. But beyond the title, and twelve full page illustrations—which might as well have occupied

three pages—we are left to wonder where the principles of the shoers' art are to be found. They certainly do not appear in the letterpress, in which the anatomy and physiology of the horse's foot, and some allusion to the history of horse-shoeing and how that might be done, is all embraced in eight pages. We are strongly reminded of the old-fashioned Dunfermline pint—"A big dish and little in't."

THE INTERNAL PARASITES OF THE HORSE. BY J. T. DUNCAN, M.D., C.M., V.S. (Toronto: Presbyterian News Co., 1891.)

This little book, written by one of the teachers of the Ontario Veterinary College, deals with some of the principal entozoa of the horse in a manner which will render it of service to veterinary students. It makes no pretence to completeness, but is arranged in a pleasant and simple manner, and embellished with some woodcuts.

A CASE WITHOUT A PARALLEL. (Edinburgh: C. and R. Anderson, 1891.)

This is a reprint from the *North British Agriculturist*, of an article which reflected seriously on the professional skill of two veterinary experts, who caused a horse to be rejected at an important show because of ringbone. The horse was subsequently examined by a number of veterinary surgeons, and pronounced free from disease. The animal died soon after, and a dissection of the incriminated region revealed the complete absence of anything abnormal. This is the gist of the pamphlet, which is—as might be expected—strongly written.

THE VETERINARY DIARY AND POCKET-BOOK.

We regret to hear, both from the editor, Mr. E. E. Bennett, F.R.C.V.S., and the publishers, Messrs. Baillière, Tindall and Cox, that "The Veterinary Diary" will not be issued in future. Those members of the profession who have during the past few years taken this little book as their pocket companion and guide, will miss it very much, and will regret with us that there was not sufficient enterprise in the profession to keep it going. The clerical, medical, and legal professions, each has its pocket diary, and supports it to an extent which makes it worth while for editor and publisher to continue it year after year. We had hoped for the same result among veterinary surgeons, but we understand that the response has been so lukewarm, and the number of subscribers so few, as to entail a heavy pecuniary loss each year on the publishers, and the loss of valuable time on behalf of the editor. There will, therefore, be no veterinary diary for 1892.

LIVE STOCK JOURNAL ALMANAC FOR 1892.

In previous years, we have remarked, with surprise, the extensive and varied amount of information contained in this annual, which seems to be out of all proportion to its price. The issue for 1892 is in no respect inferior to its predecessors, and the special articles are as numerous and interesting in all that pertains to the domesticated animals as could be desired; while the general information concerning these is extremely comprehensive and useful. There are many good illustrations. The publishers deserve much praise for their enterprise, and we hope they may be amply recompensed.

THE STUDENT. No. 1, November 20th, 1891.

This is a small venture in the journalistic way, emanating from the Royal Veterinary College, Camden Town, and, we presume, for the edification of students. The issue is announced as monthly, the size of the first number is limited to four pages, and the price is twopence. The contents consist chiefly of an editorial introductory, a reference to the STUDENTS' UNION, a characteristic poem, and sport announcements. We welcome the bantling and wish it success. If properly conducted, it should be a source of interest and a bond of fellowship to a body of young men who have many trials before them. Certainly the price should not be a hindrance to its success, though experience shows that in literature—veterinary and other—cheapness is sometimes associated with nastiness. So long as *The Student* is managed—as it will,

we trust, be—in a good spirit, and representing the higher and better aspirations of our profession—it will afford pleasant reading, as there are plenty of subjects which students can peruse beneficially through such a medium.

Army Veterinary Department.

In the *Gazette* of December 4th it is notified that the Medical Officers in the Reserve Forces are to have the same compound titles as those in the Active Army, and then the following announcement is added:—"Her Majesty has also been pleased to approve of the following alteration of designation in the rank of Veterinary Officers serving in the Honourable Artillery Company of London, the Yeomanry Cavalry, and the Volunteers, with effect from Dec. 1, 1891, viz.: Veterinary Surgeons, ranking as Majors, to be Veterinary-Majors; Veterinary Surgeons ranking as Captains, to be Veterinary-Captains; Veterinary Surgeons ranking as Lieutenants, to be Veterinary-Lieutenants; Acting Veterinary Surgeons, ranking as Lieutenants, to be Veterinary-Lieutenants."

In the *Gazette* of December 7th the following notice appears:—"The Queen has been pleased to give and grant unto William Littlewood, Esq., her Majesty's Royal licence and authority that he may accept and wear the Insignia of the Order of the Medjidieh of the Third Class, which his Highness the Khedive of Egypt, authorised by his Imperial Majesty the Sultan, has been pleased to confer upon him in recognition of his services while actually and entirely employed beyond her Majesty's dominions as Chief Veterinary Inspector to the Sanitary Administration of the Egyptian Government."

Gazette, December 11th.

VOLUNTEER CORPS ARTILLERY (1st Fifeshire).—Peter Young, gent., to be Veterinary-Lieutenant.

Gazette, December 22nd.

BUCKINGHAMSHIRE YEOMANRY CAVALRY (Royal Bucks Hussars).—Veterinary-Lieutenant H. G. Lepper to be Veterinary-Captain.

Obituary.

The following deaths have been reported:—

J. O. Hills, F.R.C.V.S., Leamington, graduated in 1867, became a Fellow in 1878.

T. Acton, F.R.C.V.S., Manchester, graduated in 1870, became a Fellow in 1884.

W. Maynard, M.R.C.V.S., Romsey, graduated in 1867.

J. T. Jeeves, M.R.C.V.S., Manchester, graduated in 1869.

Jurisprudence.

THE TERM "VETERINARY."

John Robinson, a farrier, of King Street, Kensington, was summoned to the West London Police Court, on December 8th, for an alleged infringement of the 17th section of the Veterinary Surgeons Act of 1881.

Mr. Bodilly, barrister, appeared to support the summons on behalf of the Royal College of Veterinary Surgeons, and Mr. Haynes was for the defendant.

It was stated that the defendant had the words "J. Robinson, veterinary forge," painted in large letters outside his premises.

Mr. Bodilly having stated that the defendant's name was not on the register of veterinary surgeons, proceeded to argue that the words "veterinary forge" implied that the shoeing business was conducted on veterinary principles.

Mr. Plowden: What is shoeing on veterinary principles?

Mr. Bodilly said the words held out to the world that someone was on the premises capable of taking some part in the veterinary art.

Mr. Plowden thought the words "veterinary forge" were utter nonsense without explanation, and dismissed the summons, with two guineas costs.

On the application of Mr. Bodilly, the magistrate granted a case for the opinion of a superior court.

Notes and News.

THE DOG IN ANCIENT EGYPT.—A curious paper printed in the recently issued first part of the fourth volume of the "Transactions of the Society of Biblical Archæology," by the President of the Society, Dr. Birch, Keeper of the Oriental Antiquities in the British Museum, enters largely into the archæology of the dog in Egypt. The immediate subject of the paper is a funereal steta, or tombstone, of a very old Pharaoh, Antefaa II., belonging to the tenth or eleventh Manethonian dynasty, who reigned about B.C. 3000. The steta represents the Pharaoh in colossal proportions with three of his favourite dogs in front of him, a fourth between his legs, and his huntsman, named Tekenru, behind him. There is an inscription of seven columns at the side, the purport of which is obscure, owing to a fracture of the stone, which has not only carried off the upper part of the Pharaoh's body from the waist, but has also deprived us of a third of each column of writing. We learn from it, however, that the tombstone was erected in the 50th year of the deceased Pharaoh's reign. Its first discoverer in our times was Mariette Bey, the custodian of the Khedive's magnificent Egyptian Museum at Boulac, the port of Cairo, and it is now in that collection. Through M. Maspero, the *conservateur* of the Louvre Egyptian Museum, Dr. Birch was favoured with a copy by Mariette Bey, who found the original not long ago in the valley of the Assaif at Thebes. That most systematic and successful of all modern explorers of the antiquities of Egypt was well aware, however, that there was a far earlier claim of discovery which would effectually bar his own. The contemporary Abbott papyrus gives us the *procès verbal* of an official inquisition into the state of the Royal and other state tombs at Thebes, which had been partly violated by robbers, bearing date in the 16th year of Rameses IX., say about B.C. 1000, and including a distinct mention of the tomb and steta of Antefaa II. Of the latter, this curious old State paper says:—"There is on the steta a figure of the King standing with his dog between his legs; it (the dog) is called Buhaka; examined on that day (the 18th of the Egyptian month Athor), it was found uninjured." One of the dogs on the steta now at Boulac is actually named Buhaka; but, oddly enough, as showing that Egyptian State papers were no more infallible than the rest, it is not the dog between the Pharaoh's legs, but the first of the three in front. What this name denotes, which is written over the figure of the animal in a line of hieroglyphics ending with the interpretative sign of the dog, is not clear. Luckily, however, Buhaka has an *alias*, viz., "Mahat," meaning "white antelope," and accordingly determined by that figure of the beautiful creature. Moreover, the dog himself is so well drawn that the identification of the species was a matter of no difficulty to so accomplished a naturalist as Mr. A. D. Bartlett, F.Z.S., of the Zoological Gardens. In the former of two letters from him, written before the reading of Dr. Birch's paper, and when he had nothing but drawings of the dogs to guide him, he writes:—"The dog A (*i.e.*, Buhaka) closely resembles the Dalmatian hound in form, and probably the gazelle hounds are descendants of this breed. It well represents a dog found in the north of China, barely distinguishable from the Esquimaux, which may be regarded as half wolf." In Mr. Bartlett's second letter, written after he was aware of Buhaka's ***alias***,

Mahat, indicating the dog's speciality and line of hunting, he writes :—"I am glad to hear of the dog of the white antelope. Last year I was in Hamburg on the arrival of a large collection of living animals from Africa, in which collection were many gazelles and other antelopes, together with 15 or more giraffes. With this large lot were many attendants, who brought with them two of the dogs used for the capture of the gazelles and other of the antelopes; these dogs are in form like the one figured on your paper. Dr. Birch had anticipated the remark that dogs of this species are brought at the present day from Nubia, and added that they appear among the tributes offered to Rameses II. at Beitoually, in that country, as well as among those presented to Thothmes the Great, of the next dynasty before—viz., the 18th—by the conquered tribes of Kashi, or Ethiopia. Nay, such dogs appear on the Egyptian monument as far back as the 6th dynasty. The middle one of the three dogs in front of Antefaa II. belongs to a species which puts in a still earlier appearance. It has a pointed nose, upright ears, and curled tail, like the modern Spitz. Mr. Bartlett recognizes in it the wild dog of Australia (the dingo), and it is the oldest dog seen on the Egyptian monuments appearing at the epoch of Cheops, of the fourth dynasty, the builder of the great pyramid, perhaps a thousand years before Antefaa II., whose own age can hardly be very much less than two thousand more before the opening of his tomb in the reign of Rameses IX. Antefaa's Egyptian dingo bore the name Abakar, which is doubtfully interpreted "the pied sphinx," most of the species being spotted on the monuments. In the last of the three dogs in front of the Pharaoh Mr. Bartlett, anticipated by Dr. Birch, sees a palpable mastiff. His name is Pahates, *alias* Kamu. The former Dr. Birch regards as of doubtful meaning, like that of the second dog. But the second of the two names can signify nothing else than "black," probably referring to the colour of the dog. Ethiopia seems to have been the habitat of this dog as well as of the foregoing, and to this species Dr. Birch refers the 90 bloodhounds sent by Candace, Queen of that country, to Alexander the Great. The dog between the legs of Antefaa II. is named Tekal, or Tekar—"Tiger" will at least serve as a mnemonic, though the hieroglyphical word is as obscure as the description. Mr. Bartlett considers it a sort of pet house-dog.

Diseases in Equatorial Africa.—Dr. Parke, who accompanied Stanley in his last journey in Equatorial Africa, speaks of his donkey suffering from malarial fever. "To-day my poor donkey has high fever, the effect of crossing the last river. He has had attacks of this kind several times up to the present, and always following the same cause. His temperature runs up very high, his hair stands on end, his ears droop, and he looks very miserable all over. Like master, like animal. I nearly always get fever myself when I wade a deep stream—a slight febricula has frequently followed even a cold bath since I commenced to cross Africa." Ticks, about the size and shape of a sheep-tick, fixed themselves in the nostrils of the men, and gorged their bodies with blood. In removing them by means of forceps, they generally carried the mucous membrane with them.

Preservation of India-Rubber Articles.—The rapidity with which articles made of india-rubber—tubes, bands, &c.—deteriorate is well known, and is sometimes a serious objection to the employment of this material, The Berlin Polytechnic School recommends that such articles be kept immersed in water containing a small quantity of culinary salt.

Etiology of Actinomycosis.—At a recent meeting of the Medical Society of Griefswald, Professor Grawitz exhibited the inferior maxilla of a calf that had succumbed to actinomycosis. In sawing through the fungous masses and bone, several grains of corn were discovered, and it was surmised that the actinomyces obtained admission to the tissues through the abrasions made by these grains.

Correspondence.

QUEENSLAND ITCH.

SIR,—In the October number of the VETERINARY JOURNAL, page 274, in an extract from the proceedings of the Royal Society of Queensland, dated, Brisbane, August 7th, 1891, when a paper was read by Dr. T. L. Bancroft, M.B., of Edinburgh, on "Psoriasis in Horses," known as "Queensland Mange"; and from the extract in question, Dr. Bancroft appears to have stated that investigations had been made into the pathology of this disease in Queensland, New South Wales, and India. These investigations he designates as "absurd," as, in his own words, "they were carried out by men lacking the necessary ability." Dr. Bancroft then appears to have taken unto himself the credit of having discovered that the disease is "Psoriasis," and not "Scabies." As I have never been in Queensland, I cannot of course speak about that colony, but as I have been in both New South Wales and in India, I can about those countries; and, with all due respect to Dr. Bancroft, I would beg to point out that his so-called discovery comes a little late in the day. Dr. Bancroft says he commenced studying the disease in 1884; I first came out to India in 1878—six years previous—and at that time it was well known that this particular skin affection was "Psoriasis," and as such it was classified in the register of disease in the veterinary hospitals of the Army. During a recent visit to New South Wales, I was informed by Mr. Stanley, F.R.C.V.S., Veterinary Surgeon to the New South Wales Government, and who had formerly served as Veterinary Surgeon of the 5th Lancers, in India, that he had recognized the Queensland mange to be the same as the Indian Psoriasis, on his first arrival in the colony some years ago.

L. J. Blenkinsop, Esq., A.V.D., informs me that while at the Remount Depôt, at Garden Reach, Calcutta, during the months of January or February, 1890, a number of Queensland horses—branded W K 7 on the near shoulder—were imported by a Mr. Hunter into Calcutta. Some of these animals were suffering from what the attendants called Queensland mange, and that he at once recognised the disease as being the same as the Indian Psoriasis. As for the course of treatment suggested by Dr. Bancroft, it has been tried for years past in India. I am loth to trespass on your valuable space, and the only reason I do so is the insinuation that appears to be made by Dr. Bancroft that the officers of the Army Veterinary Department, serving in India, are ignorant men, lacking in professional ability; and the claim that he, Dr. Bancroft, makes of a so-called discovery which was known to the veterinary profession years ago.

JOSHUA A. NUNN, F.R.G.V.S.,
Principal, Lahore Veterinary College.

Lahore, Punjaub,
East Indies.
November 17th, 1891.

VETERINARY EDUCATION.

DEAR SIR,—I have been struggling very hard indeed to understand what Mr. McLaughlin's long letter is all about; but, so far, all I can comprehend is that we must open very wide the gates of the veterinary colleges, so that students can come and students can go as fully qualified men in the quickest possible manner, very much on the same principle that they manufacture sausages in Chicago—I am informed that the live pigs enter at one end, and the sausages pass out at the other; the whole transaction takes place in the small period of one minute. Seeing that Mr. McLaughlin had been honoured with so much space in your journal, I concluded at once that there must be some useful matter therein.

I have visited the veterinary colleges at New York, Chicago, and Toronto, and I know well that they pour out veterinary men—not by a gentle stream, but by the flood, much like the way the water comes down at Niagara Falls. But still, Mr. McLaughlin cries, "Give us more! more!" Not long since, a merchant in the United States sent as a present to an English banker, a diploma, upon which the Britisher's name was engraved with the letters M.D. Let me suggest this to Mr. McLaughlin, as a quicker plan.

"IN SPITE OF ALL TEMPTATIONS, ETC., ETC."

December 12th, 1891.

THE HORSE'S FOOT.

SIR,—In answer to the editor's kind remarks on my question in the last copy of this *Journal*, I think it would be better that I should not reply at present to them, in order to allow any of the other readers to pass their opinions on this subject—important to the veterinary surgeon and shoeing smith. I *consider also that it is through the medium of a Journal, such as this*, that *free, unbiassed*, and *not personal discussions should take place*, giving a *great number a chance* to say *something on a subject* suggested by some readers. This, besides being of benefit to the enquirer, would also help all those reading to get information. I hold that it is more useful and instructive to ordinary practitioners, than a number of foreign reports and other subjects. In fact, it would be something to make one long for the next number, instead of the usual coldness with which it is received and hurriedly passed over by a number of its readers with whom I am personally acquainted. Hoping to have some answers in the following number from some gentlemen who will be kind enough to express their opinions.

"ENQUIRER."

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from J. G. Rutherford, Portage la Prairie; J. F. Fisher, Brandon, Manitoba; C. Pack, Lymington; E. Clarke, London; H. J. Dawes, West Bromwich; W. A. Hancock, Newcastle-on-Tyne; A. T. Robinson, Montreal; J. A. Nunn, Lahore; "In Spite all Temptation;" "Enquirer;" A. W. Hill, London: J. D. Pottie, Paisley; H. G. Rogers, London; R. A. N. Powys, London; P. Moir, Edinburgh.

BOOKS AND PAMPHLETS: *M. Kaufmann*, Traité de Thérapeutique et de Matière Médicale Vétérinaire; *T. Walley*. A Practical Guide to Meat Inspection; *F. Smith*, A Manual of Saddles and Sore Backs; La Cerimonia, etc., del Primo Centenario della R. Scuola Superiore di Medicina Veterinaria di Milano; Report of the United States Secretary of Agriculture; *J. T. Duncan*, Internal Parasites of the Horse; A Case Without a Parallel; *R. S. Hindekoper*, Age of the Domestic Animals; Bulletin des Séances de la Soc. Nationale d'Agriculture de France; Procès-Verbal de l Académie Royale de Méd. de Belgique; Encyklopodie der Gesammten Thierheilkunde und Thierzucht; Bulletin of the Johns Hopkins Hospital; Report of the United States Secretary of Agriculture for 1891; *G. Chenier*, Le Tondage du Cheval.

JOURNALS, ETC.: *Australasian Veterinary and Live Stock Journal; American Veterinary Review; Recueil de Méd. Vétérinaire; Annales de Méd. Vétérinaire; Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie; Live Stock Journal; Echo Vétérinaire; Revue Veterinaire; Lancet; North British Agriculturist; Edinburgh Medical Journal; Proceedings of the Royal Geographical Society; Lahore Veterinary Journal; Journal de Med. Veterinaire et de Zootechnie; Thierarzt; British Medical Journal; Archiv. für Wissenschaftliche und Praktische Thierheilkunde; Reportorium der Thierheilkunde; Clinica Veterinaria.*

NEWSPAPERS: *South Africa; Baltimore Weekly Sun; Scotsman; Lahore Civil and Military Gazette.*